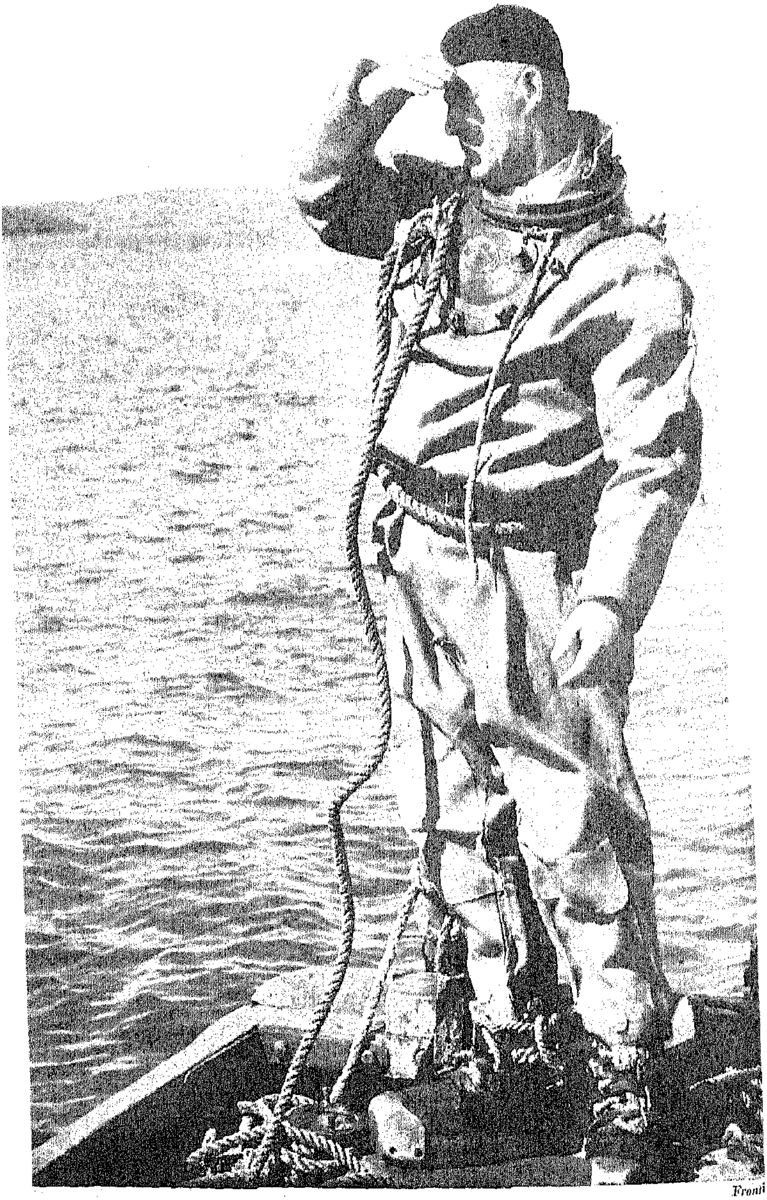
DON'T FORGET
THE DIVER

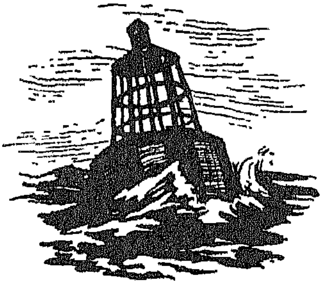


Front.

The author in diving gear.

DON'T FORGET THE DIVER

C. A. CHARD



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To the memory of
D Compton-James
who helped to write this book

PREFACE

I suppose I really ought to have carried some life insurance, or at the very least a personal accident insurance. Looking back today, at the age of 70, I am appalled at my carefree confidence as a young man, in challenging the sea for thirty years in more than ten thousand dips, without putting down even a penny a week towards my funeral expenses.

Most of my dips were routine stuff, a man at work doing an ordinary job but in a peculiar place. Nevertheless, I was certainly lucky in that I came through all this underwater activity in one piece. There were some narrow escapes, and among them some real headline adventures.

Read on and I will tell you how I got to be a deep-sea diver, and about the thrills and spills exactly as they occurred.

FALMOUTH,
April, 1958

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Chapter 1

THE MAGNETIC COAST

BACK in the year 1887, the year in which I was born, most of the inhabitants of Falmouth relied on the sea for their livelihood. My father, for instance, was a Trinity House pilot. Today there are Trinity House pilots who pay their surtax demands as a matter of course. These are the big boys, the Channel pilots, who live mostly at Gravesend, and bring the big ships up from the Lizard to the Thames. My father never earned enough to pay income tax, let alone surtax.

Falmouth was then a declining port because steam was ousting sail and steamships could easily prolong their voyages beyond Falmouth. In the days of sail most ocean-going ships had been only too glad to acknowledge Falmouth Harbour, big enough to float a fleet in almost land-locked security, as journey's end after many weeks, even months, of toil and struggle, fighting adverse winds, riding out gales with the doubtful help of bags of oily fish scraps suspended from the eyes of the ship, loitering through the boredom of The Doldrums. They were glad enough to call in at Falmouth for fresh food instead of dogsbody and dandyfunk, fresh meat instead of black salt pork that had originally been barrelled in brine as supplies for the Crimea, fresh water instead of the stale, flat, bilgey stuff which was all that was left at the end of a long voyage, if indeed there was any water left at all; to get repairs done to the damage they had invariably suffered in their inevitable battles with the elements of wind and water. Yes, the advent of steam and its application to the propulsion of ships, certainly made a lot of difference to Falmouth.

I was born at number 3 Waterloo Place, Falmouth—a square, flat-fronted cottage situated in a pudding-bag street the entrance to which was, and still is, barred to vehicular traffic by two granite posts about three feet high, the left-hand one slightly crooked. I remember those posts, particularly the left-hand one, because during a hurricane—you might almost call it a blizzard—which hit Falmouth in 1891, the wind picked up my small person bodily and flung me against this post, to the everlasting detriment of the jug of milk I was carrying home to my mother. I mention this incident to give an idea of the kind of weather that sometimes greeted ships when they reached England in winter-time.

My father, himself one of a family of 22 children, eventually had 11 children, of whom I was the sixth. Owing to the dearth of shipping he was often hard put to it to make ends meet when the fortnightly share-out of pilots' fees was made. Sometimes his share was as low as ten shillings—an impossible sum even then, on which to feed and clothe a large family. It followed as a matter of course that we youngsters went out to work as soon as we were old enough to take any kind of job, which in my case was at the age of eight. Of course, these were only spare-time jobs. Even in those days one did not leave school at the age of eight: in fact I did not leave school until I was eleven. However, that had given me nine years of schooling. Mothers got their children out of their way early in those days. I started school at the age of two, and it wasn't a kindergarten.

In my summer holidays from school I often accompanied my father in the pilot-cutter out to the Scillies to pick up incoming ships, but most of my out-of-school time was spent, when I was not working, on the waterfront, watching the big ships entering and leaving the harbour. I knew them all by name and some of them were famous names in the last days of sail, because Falmouth was the terminus of the Grain Race, an annual " event " in which the grain ships from Australia competed among themselves to arrive first in England. There was no prize for winning this race, only the commercial prize of perhaps being able to sell the grain at a slightly better price than would obtain when the rest of the grain fleet arrived.

Even at that time most of the Australian corn came to England by steamer, but Australian farmers whose cornfields lay off the beaten track preferred the windjammers for several reasons. They saved the cost of sending the corn by rail to the nearest Australian port and the cargo rates for the voyage were much lower than steamship quotations. Cargo insurance premiums were higher, but the net saving was considerable.

The additional length of the voyage had no adverse effect on the price the wheat made on arrival in England. Farmers who sent their wheat by steamship sometimes found that the glut of grain tended to shorten prices. If they wished to hold on for a rise they had to pay for storage in England. The windjammers saved this cost. They were floating granaries which could not be tapped until the first glut of the market had passed and steadier prices had arrived.

And so the windjammers survived on the Australia-Falmouth run, but their place became more and more precarious with each passing year. To some extent the windjammers of the grain fleet were subsidised. British apprentices would pay £40 each for the privilege of working aboard a windjammer for no wages. They could not obtain a master's ticket without experience in sail. Also Trinity House had a rule that no person could take up an appointment as a Channel Pilot without having served for at least two years as a mate in sail. This rule was repealed in the 1930's because it was clear that there would soon be no windjammers left on the seas. Each succeeding year saw more casualties and retirements. In the 1890's there were 50 or more ships taking part in the Grain Race. By 1929 this figure had dwindled to 25 and by 1939 there were only 13 vessels taking part. In 1935 the last full-rigged ship of the grain fleet, the *Grace Harwar*, was condemned and sold for scrap and the barque *Lingard*, damaged in a collision, was judged unfit for further use. In 1936 the *Parma* jammed her prow too hard against a stone quay at Glasgow and had to be scrapped. The *Ponape* proved unprofitable and was sold to the shipbreakers. The pride of the fleet, the *Herzogin Cecilie*, ran aground near Salcombe in 1938 and eventually the sea broke her up after salvage attempts had proved unsuccessful.

These were some of the boats I grew to know and recognize as they rounded the headland at the west point of Falmouth Bay.

After a while, however, another boat began to attract my attention—a dingy little ex-gunboat called the *Mallard*—that remained stationary at various points in the bay. Most of the time its occupants seemed to be perpetually turning a pump handle or watching the water, or both simultaneously. I used to think it must be a very leaky boat but after I had seen it close inshore I noticed that the pump was connected to a pipe that hung overboard, and whenever the pump was working a stream of bubbles came to the surface, apparently from the bottom of the sea. I found it difficult to understand this because I did not then realize that a pump can pump air as well as water. This stream of bubbles did not stay in one place; it moved about slowly and deliberately. Sometimes the bubbles broke surface at the side of the boat; sometimes their point of emergence was 50 feet away. I had previously seen, in the semi-stagnant waters of Swan Pool at the other end of Falmouth, the slow oily gulps of marsh-gas. I did not then know what they were but I sensed that they were natural phenomena. These sea-bubbles were man-made, of that I was sure, and in some way connected with the boat and the pumping.

One evening at tea-time I asked my father about the bubbles. It was some time before I could make him understand what I was referring to, because, like most children asking questions, I had posed this one out of the blue in the sense that it bore no reference to the previous conversation at the tea-table. While the family talk had been going on I had been living in a world of my own, pursuing an entirely different line of thought. Eventually, as so often happens, it was an elder brother who supplied the missing link; amongst themselves children are great little mind-readers.

"He means that diving-boat, the *Mallard*," explained my elder brother.

"Oh!" exclaimed my father. "Well, it's just a diving-boat. A man dresses up in a rubber suit and goes down to the bottom of the sea."

"What for?" I asked.

"Well, to look for wrecks and to break them up," he replied. I had some more supplementary questions on the tip of my tongue, but I kept them back knowing from experience just how far I could go with supplementaries.

"I think I'd like to be a diver," I mused, helping myself to another piece of bread and scrape.

"You'd better forget about that," laughed my father. "You've got about as much hope of becoming a deep-sea diver as you have of becoming Mayor of Falmouth."

In childish flights of fancy one soars effortlessly over difficulties and I began to dream of combining the two ambitions, but these thoughts were only for the secret places of my mind; they were not to be exposed to the easy derision of the family. Even the incongruity of the idea that a deep-sea diver might also be mayor did not strike me; and it was incongruous—a combination of circumstances that had almost certainly never happened before in any part of the world, the sort of " double " that would delight the heart of a punter.

In spite of my father's explanation I did not fully understand what the men on the *Mallard* were doing. I watched the boat more closely and for longer intervals. Every now and then a man pulled up a line that hung overboard, and hauled into the boat the most odd-looking lumps of metal. Fishing, both as an art and a trade, I understood: I had practised it, as an art, myself—and not without success—for there was good fishing to be had in Falmouth waters. But this was the queerest kind of fishing I had ever seen. One day I stayed on long beyond my dinner time to watch, and finally something came up out of the sea and climbed the ladder that hung over the stern of the boat. It was as if a modern boy, having found a saucer-like object, saw it open and watched the emergence of a weird thing from outer space. My " thing " from the bottom of the sea had an uncouthly human shape and a bulbous metallic head with, apparently, three eyes, one at the front and one at each side.

Still, I stayed on. The front " eye " was unscrewed and I could clearly see the face of a man inside, a man with a huge black moustache. I knew him: it was Jack Rawlings. He played Rugby football for Falmouth Albion. Then the helmet itself was unshipped, revealing more clearly the identity of the man inside. I noticed that he was wearing a red woollen cap and I wondered why. Finally the rubber suit was removed and Jack Rawlings stood fully revealed in his ordinary human form. Obviously by some means I could not yet fathom, he had been walking about on the bottom of the sea, picking up lumps of metal and sending them topside. It was all very strange, much stranger even than most of the acts of grown-ups. I knew already from personal experience that water was unfriendly to human beings and I wondered how he managed to perform this miracle.

The *Mallard* belonged to a Plymouth salvage contractor named Sandover. He employed two of the Rawlings brothers, making a strange and somewhat precarious living by salvaging metals from the wrecks that littered the Cornish coast, a trade that involved a considerable amount of deep-sea diving. I watched the *Mallard* more frequently and the desire to know what it was like at the bottom of the sea, to walk there myself, grew into an obsession. I am afraid I plagued my father with all sorts of questions, the answers to which he did not know.

At a very early age I learned to swim and dive, to swim under water with my eyes open, disregarding the sting of the salt on the tender membranes, but I could never get deep enough to satisfy my curiosity about the strange underwater world, never far enough down to see fish in their natural habitat, to find out how and where seaweed grew, whether lobsters walked forwards or backwards. The most I ever saw in these shallow dives was dappled sunlight diamond-patterned by the waves above, throwing strange pictures on the screen of silver sand or playing hide-and-seek among the waving fronds of weed; the most I ever salvaged from the sea-bed were shells and stones. As some boys long to become engine-drivers, I yearned to become a deep-sea diver. I saw few trains, but I was always catching glimpses of the Rawlings brothers engaged in their strange and unusual occupation. Sometimes I would wait on the old quay, built with long flat stones set in curious vertical formation, for their boat to come in at the worn green steps, to see at close view what they had brought up from the depths of the sea.

Boats and wrecks formed an important part of the life of the Cornish coast-dwellers, and even at this date there were traces of the old wrecking spirit left. True, the Cornish no longer actually lured vessels on to the rocks with false lights, but they were quick to take advantage of any flotsam and jetsam from a wreck that might be cast up on their beaches.

Near my home there was a road-junction from which there was a clear view over Falmouth Bay as far as the Manacles, and in those days, before the advent of wireless and ship-to-shore telephones, the bumboat-men used to gather at this vantage point to watch for ships rounding the headland. As soon as they saw one, they would rush pell-mell, at some risk to their limbs and even necks, down the narrow, twisting, stepped alleys to the waterfront, tumble into their quay-punts, which were nothing like punts but more like cabin-cruisers, and race against each other to be first to meet the incoming ship in Falmouth Harbour. Their object? To bring passengers and crew ashore, each punt being licensed to carry 12 passengers, and to take orders for stores and goods required by the ship. They were, in fact, water-taxis.

One evening in October 1898 as I was trundling my hoop homewards in the fast-fading light, there was the usual group of longshoremen and idlers at this corner, looking out to sea. It was a wild and windy day and even in the sheltered Falmouth Harbour the sea was covered with white horses. I, too, stopped and stared, listening idly to their conversation. It seemed that they were waiting for the Dublin packet-boat, which was overdue. As we waited and watched, our patience was rewarded; the lights of a ship came round the headland.

"There she is!" went up the cry, and the longshoremen raced off down the steep hills to the sea, leaving a few loungers and my small self to watch the further progress of the ship. Just as I was about to turn away to continue my belated homeward progress, the ship fired a rocket. Then all her lights went out.

"By God! She'm on the Manacles!" the watchers shouted.

She was, indeed, on the rocks, but it was not the Dublin packet-boat. It was another ship, the *Mohegan* of the Atlantic Steamship Company. As the idlers scampered downhill to spread the news of the wreck, this fact was not known. Indeed, there was no reason for the *Mohegan* to be anywhere near the Manacles. I turned away with my hoop and hurried home, hoping to appease my mother's wrath because I was late, with the news of what I had seen.

It was not until the next day that my father brought home the full story of the wreck.

"I can't understand what she was doing anywhere near Falmouth," he said. "When she struck, she was going the wrong way."

It transpired that the *Mohegan*, a new ship built in the year 1898 at a cost of £140,000 and commanded by Capt. Griffiths, commodore of the Atlantic Steamship Company's fleet, left Gravesend on October 13, 1898 having on board 53 passengers, a crew of 96, six cattlemen, and one stowaway. She carried a general cargo which comprised Manchester goods, bales of hemp, and antimony. On the afternoon of October 14, the *Mohegan* signalled "All's well" to Prawle Point, the southernmost tip of Devon. Later, in the vicinity of the Eddystone Lighthouse, the watch was changed and her course was stated to have been west by north. This would account for the fact that the ship was out of the usual down-channel course.

Obviously there must have been too much north in the course set, otherwise she would have cleared the Lizard and made the open sea without any difficulty. My father had heard reports that the *Mohegan* had been seen in the mouth of Helford River late in the afternoon. Realizing that she was too close in for safety, she must have swung round to get away from the shore, and when we saw her lights she was actually travelling up-channel instead of down-channel. In her haste to get away from the coast, she strayed into the area covered by the Manacles and struck the Vase Rock at 7 p.m.

Within 20 minutes the ship was submerged except for the funnel and masts. In response to the distress rocket, the Porthoustock lifeboat put out to sea and, although severely handicapped by the weather and the strong tides, succeeded in rescuing 44 people. The remainder, some of whom had climbed into the rigging of the ship, were drowned.

This wreck was my first introduction to the Manacles. Previously it had been only a meaningless name, casually heard in grown-up conversation. I learned that it was roughly a square mile of rocks, each with its own particular name, lying about half-a-mile off-shore near Porthoustock. As far as ships are concerned, it is a veritable graveyard. Wrecks lie so thickly there that they sometimes lie on top of each other.

The names of all the ships that have gone down on the Manacles are not even fully recorded. Local farmers have been knocked up on gale-swept nights by survivors from ships the sinking of which no one ashore witnessed. And as it is almost a miracle for any survivor to reach the shore unaided, it is obvious that some ships must have gone down there without anyone ashore being the wiser. No one, for instance, expected that the *Mohegan* would be anywhere in the vicinity of these rocks.

All the rocks of the Manacles except one, Carn Du, are covered at high water, but several are exposed at other states of the tide, and the whole area abounds with points, ledges, and shelves of rock just below the surface of the water. Between some of the rocks there is water plenty deep enough for the passage of steamers, but to pilot such a vessel through them would require a lifetime of experience of this area in the pilot service, and even then it would be risky. There is a story, probably apocryphal, to the effect that during the Napoleonic Wars, when the mails were still being carried notwithstanding the danger to shipping, a Falmouth packet-boat was chased by a French frigate and made her escape by running through the Manacles, the Frenchman being duly wrecked as he tried to follow.

The word "Manacles" has nothing to do with handcuffs. It is an anglicisation of two Cornish words "maen eglos" which mean "church stones". Probably the first Cornish sailors remembered them because of their proximity to St. Keverne church, which became a landmark to avoid. Shore landmarks are certainly connected with the names of some of the rocks: thus Maentrenoweth is in line with the village of Trenoweth.

At that time there was a local theory (indeed I have heard it expressed today) that the Manacles attract ships because the ironstone content of the rocks deflects the compass-needles of ships in the neighbourhood. Generally it is believed that no other rock in the British Isles has so much power over a compass-needle as Compass Rock on the Isle of Canna in the Hebrides, but stones have been obtained from some parts of Cornwall, the magnetic power of which surpasses that of the Canna stone. All the rocks from Porthallow to the Lizard are more or less magnetic and it was noticed in the course of obtaining specimens for examination that the friction of the saw used in cutting off pieces of stone increased temporarily the magnetic quality of the stone. This gave rise to the theory that during a storm, when millions of stones and boulders are dashed about under water, their magnetic quality may be temporarily increased, to the danger of shipping.

The wreck of the *Mohegan* on the Vase Rock was one of the highlights of my boyhood, but even in my wildest imaginings, which included becoming a deep-sea diver and Mayor of Falmouth, it did not enter my head that I should one day walk the decks of that dead ship as she lay in the graveyard of the Manacles.

Chapter 2

THE RUNAWAY DRUM

MY school days were short-lived and dreams of becoming a deep-sea diver were pushed into the background by the urgent necessity for earning money. The state of the family finances was such that from the age of eight I was doing spare-time and week-end work as an errand-boy, earning—at first—one shilling a week, but even one shilling a week was a great help to my mother in balancing her family budget. It would, for instance, buy most of the bread the family needed for a week. Looking back, I can see that my father was just unlucky in choosing what turned out to be a declining profession. He was one of too many pilots serving too few ships. I might have been just as unlucky myself had it not been for the intervention of two world wars.

One of my spare-time jobs was as errand-boy for Mr. Joseph Grose, a draper who was at that time Mayor of Falmouth. He paid me well—eighteenpence a week for evening work from 4.30 p.m. to closing time which was usually at 8 p.m. but might be 9 p.m. on Fridays and Saturdays. Mr. Grose was a typical Victorian draper. He was tall, of medium build, with side-whiskers and a chin fringe, and he was going rather bald on top. He wore a stand-up collar with sharp points that made him carry his head high under pain of puncturing his chin. He wore early Victorian dress with drain-pipe trousers and looked rather like a modern Teddy-boy. He wore across his waistcoat an elaborate gold chain with a seal dangling from it, and when going out, a square bowler of Churchillian type. Mr. Grose was a good employer but a strict disciplinarian, especially on the subject of punctuality. Since my job with him lasted for over twelve months, I suppose I must have been fairly satisfactory as an errand boy. My chief failing, as far as Mr. Grose was concerned, was my habit of dawdling over my errands and consequently being late for the next job on the list. Most of this dawdling was due to the fact that I never lost an opportunity, when I was near the waterfront, or could see over the harbour, to look out for the *Mallard.*

" Boy!" he used to say. " When will you learn that unpunctuality is the thief of time. You must always keep to time. Look at me, for instance! I was a poor boy just like you, yet today here I am, owner of my own business and Mayor of Falmouth. . . ."

This mention of the mayoral office interested me far more than the lecture on punctuality.

" How do you get to be a mayor, sir?" I asked

" Well, that's a long story," he replied. " First of all you have to get yourself elected by public vote on to the town council and then after serving on the town council for some years and earning the respect of your fellow-councillors, they may elect you mayor for twelve months, or perhaps even longer. But don't bother your head about that, boy, because you're never likely to become mayor of anywhere. You're too much of a dreamer."

At the age of eleven, able to read, write, and figure reasonably well, I left the little Church of England school for good, and took a full-time job with a carriage-builder named Harry Reece at a wage of 2*s.* 6*d.* a week. Mr. Reece, who was stoutish and walked with a limp, had lived in South Africa for some time and I think he must have been in charge of native labour there for he tended to treat his staff as though they were natives. He made Jersey cars—open four-horse carriages that were the forerunners of charabancs; he also made landaus, and jingles.

One day my employer told me to harness myself between the shafts of a jingle and take it to the market at the other end of the town. I suppose I was just short of thirteen years of age at that time, big enough and strong enough to do the job required, but for some reason which I could not then actually identify I resented being treated as a beast of burden. Perhaps it was merely accumulated resentment at the peremptory tone of his voice or at his calm assumption that a human being would undertake the work of a domestic animal.

"I'm sorry, sir," I said, "but I don't wish to do that."

"Nonsense, Chard," he snapped. "Get into the shafts or you'll be sorrier still."

The implied threat of dismissal angered me. Perhaps it was not so much the threat of dismissal as his calm assumption that by making such a threat he could force me to do anything he wished me to do.

"No, sir," I declined sturdily. "When you see donkeys' ears growing from my head you can expect me to do donkeys' work, but until that happens, I won't."

"Very well, Chard," he retorted. "You're sacked."

I never dared to tell my mother that I had lost one job until I had found another. This meant swift action—getting myself fixed up before the end of the week. I was lucky again. Before the end of the week I had found another job, this time as apprentice shipwright at Falmouth Dockyard, a private concern run by the five brothers Cox. This involved a 20 per cent reduction in pay. Naturally an apprentice could not expect to earn as much as a casually-employed boy. So I had to accept a starting wage of 2*s*. 0*d*. a week, rising by one shilling a year until the end of my time, when I would be earning 7*s*. 0*d*. a week.

The working day started at 6 a.m. From 8.30 to 9 a.m. there was a break for breakfast, from 1 p.m. to 2 p.m. a break for lunch, and the final whistle of the day blew at 5.30 p.m. Intermediate tea breaks were at that time unheard of. On Saturdays we worked from 6 a.m. to 1 p.m. with half-an-hour off for breakfast. Fifty-six and a half hours of work a week for two shillings—less than one halfpenny an hour. I pass no adverse comment on this except to say that in such conditions maybe you have the agar in which industrial strife and class hatred is likely to breed. For myself, I soon became self-employed and free from this tyranny of long hours and low wages with starvation always lurking round the corner, but if, in my later public life, I was sometimes to be found a little left of centre, I think that these early experiences of working conditions were probably the reason for that.

At the dockyard we built small tugs and similar craft for customers all over the world, doing practically everything from the laying-down of the keel to the fitting of the truck on the mast. Exceptions were putting in the engines and the plumbing. These two specialist jobs were contracted out. We also did any necessary repairs to large ships that came damaged into Falmouth Harbour. There was less repair work than there had been in the palmy days of sail, when from length of voyage alone, ships were much more likely to encounter tempest and hurricane. These were the expiring years of the Grain Race, when sailing ships carrying wheat from Australia, battled their way half across the world, sometimes taking six months to complete the trip and almost invariably breaking or losing some of their gear during the voyage.

The first year of my apprenticeship was spent almost entirely in heating rivets. For this purpose a small forge was set up, usually on the same stage on which the riveters themselves were working. A bellows underneath kept the fire going and when a rivet was white-hot I picked it out of the fire with a pair of tongs and either handed it or threw it to the waiting riveter. There were none of the long throws and smart catches that occur in a day of riveter's cricket among the steel girders of modern building construction: it was all fairly close-range work.

In my second year I was allowed to bolt plates into position with pilot bolts so that the riveter could follow on and bang the rivets home. These plates were made from timber templates which were used as guides. The timber templates were fitted up against the last fitted plate and marked as to where the rivet holes had to go. Then the templates were taken back to the workshop and fitted over the next plate, the position of the holes being pricked in the metal with a punch. The whole plan of the plating was laid out on a screeve-board in the mould loft. From this plan the steel plates were made and notionally fitted. Other jobs included fixing fairleads (guides through which ropes and hawsers pass), bolting down bollards, winches, etc.

It was good all-round experience of a shipwright's job. You had to be carpenter, smith, and mechanic rolled into one. Though I chafed continuously at the meagre wage, I realized—young as I was—that the job provided compensation over and above mere wages. The work and the practical knowledge I was gaining from it, eventually created in me a capital element, a personal skill that gave me earning power above the average for the rest of my life. So I personally do not complain, did not complain, about the bargain. Indeed, I have no doubt that we apprentices were sometimes more trouble than we were worth.

For instance, at that time I was a cornet-player in a junior brass band (how my family and the neighbours in Waterloo Place must have suffered!) and some of our most interesting engagements—interesting, that is, from the viewpoint of a healthy, always-hungry boy—consisted of playing at Sunday-school treats which, unfortunately, were never held on a Sunday. We particularly liked these jobs because the band was liberally provided with Cornish pasties, sausage rolls, sandwiches, saffron cake, lemonade and ginger-pop—a boy's conception of the ideal diet—as our payment for performing.

As a working boy, it was difficult for me to get time off on weekdays. I don't suppose foremen were really any tougher in those days than they are now, but I had already used up all the time-honoured excuses for seeking time off when there came the preliminary announcement of a school-treat that was regarded as the comestible high spot of the year. I imagined that it would be quite useless to ask the foreman for time off, partly because I had taken my pitcher to that well once too often already, and partly because our bass drummer, Charlie Tooley, also apprentice shipwright at the dockyard, had successfully forestalled me. You could always trust Charlie to get in first where food was concerned. It was most unlikely that the foreman, even if he were in a good mood, would allow two apprentices to be absent together.

My current job was that of fitting new wash-ports in the bulwarks of a tug afloat in the dock. These are simply hinged flaps that open vertically, outwards only, to permit the escape of water that the boat has shipped when dipping her bows into a wave. I was working on the seaward side of the vessel and my working platform was a stage slung overside by ropes from each of its four corners, the ropes being secured to stanchions inside the bulwarks. Having failed to dream up any plausible excuse with which to approach the foreman, I persuaded a fellow-apprentice who was working on deck, to cast off two of the ropes supporting my stage. The platform tilted and shot me into the muddy water. I clambered back on board, shaking myself like a spaniel, and squeezing some of the water from my clothes. The foreman was waiting for me.

"What happened?" he asked.

"Please, sir," I said, "I fell into the water."

"I can see that for myself," he replied. "How did it happen?"

"I suppose the knots must have given way."

"Who tied the knots?"

"I did, sir."

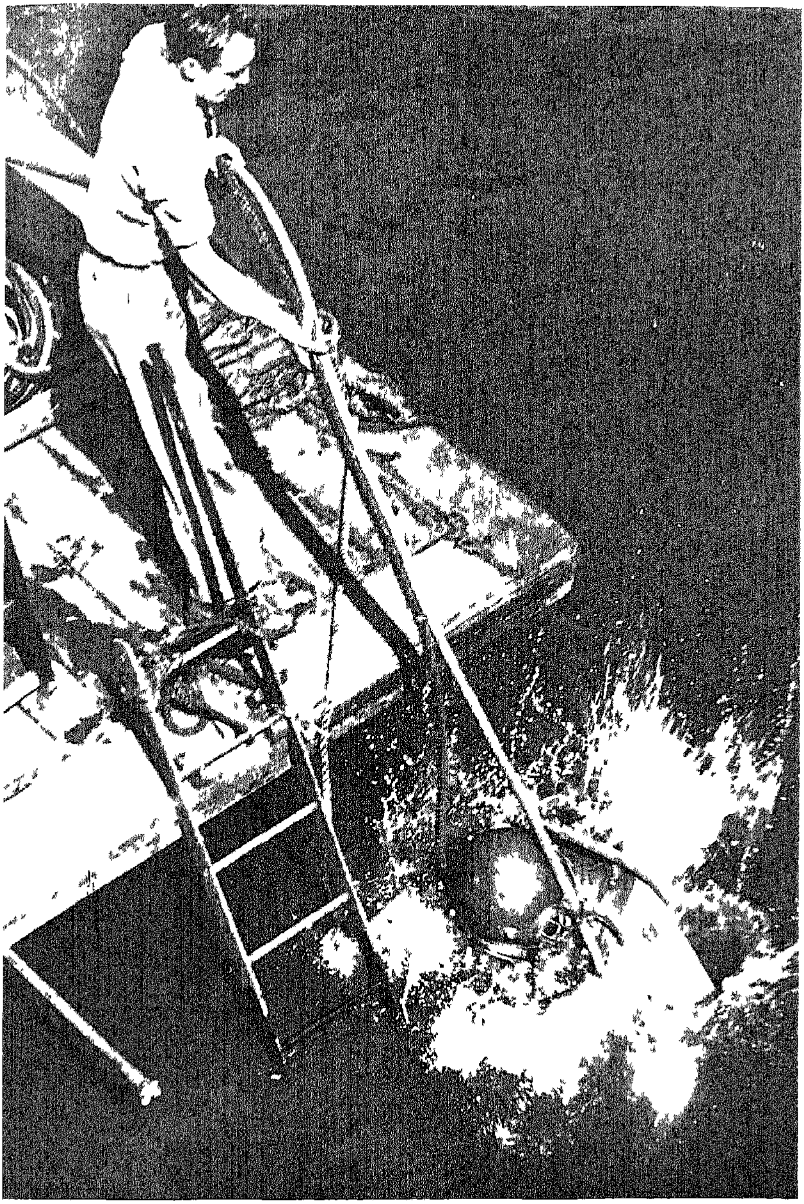
"Well?"

"I suppose I must have tied slippery hitches."

The foreman examined the remaining knots. "These two are not slippery hitches," he remarked. "Now I suppose you want to go home and change."

"Yes, please, sir," I agreed.

"And it's such a long way to go that it's hardly worth while for you to come back."



PAUL POPPER

A Royal Navy diver at work.

"Hardly, sir."

"And even if you really wanted to come back, your mother will probably insist on putting you to bed so as to ward off possible after-effects."

"Yes, sir," I said, glumly. He had, in fact, touched on the weak spot in my scheme. My mother would probably do just that.

"All right, cut off then," smiled the foreman. "Tooley is just going. But the next time you want to go to a school-treat, you might try asking me first."

At these school-treats it was the custom for the band to march round the sports field leading the Sunday-school scholars in procession. Behind the band marched our bass-drummer, Charlie Tooley, a Bunterish figure, stout and so short that he could not see over the top of the drum, and so had to gauge his position and distance from the headgear of the players on his right and left. At the exit from the field there was a dip in the ground, a vestigial ha-ha. As we approached it, Charlie failed to notice the dip, could not see it in fact, lost his balance and turned a diving somersault over his drum.

I heard the off-beat sound of the drum as it hit the ground and turned my head to see what had caused it. The spectacle of Charlie's arms and legs outflung in a futile X as his fat stomach balanced momentarily on top of the drum was slapstick humour at its most excruciating, and for those who saw it, which included most of the Sunday-school scholars, the sight "brought the house down".

A queer thing humour! Why do we tend to laugh so heartily at the physical misfortunes of others? I only know that even today, nearly sixty years after the actual event, when my mind's eye conjures up a picture of Charlie Tooley, diving spreadeagled over the runaway drum, I cannot help chuckling reminiscently. If it did nothing else, the incident certainly fixed in my memory the meaning of that unusual little word " ha-ha ".

Chapter 3

I DIVE FROM A "FISH"

AT the end of my apprenticeship, the only work that offered in Falmouth was with the Cox brothers, the firm I had worked for as an apprentice, but the wage offered was only 25*s.* 0*d.* a week—a fair enough wage, I suppose, for Falmouth (indeed the foreman of the firm was drawing only 26*s.* 0*d.* a week) but I thought that this figure was too low to compensate me for my long, arduous, and poorly-paid apprenticeship, especially as firms in other parts of the country were offering half as much again for shipwrights. Charlie Tooley shared my views. We felt we had paid the full price for our technical skill and knowledge and now we were entitled to try and make it pay good dividends. In any case we both felt rather chary about working as men where we had served as boys. Many there would still regard us as boys. So we looked further afield.

We both wrote simultaneously after jobs at Devonport and Sierra Leone. Now, of course, I realize that applying for several jobs simultaneously is inconsiderate. It must put one prospective employer to a certain amount of unproductive trouble. At the time, however, it seemed to be an almost essential short-cut, with the bogey of possible unemployment lurking round the corner. In those days, before the advent of the Welfare State with its over-numerous employment exchanges and its unemployment relief pay, the prospect of being out of work for any length of time was really frightening.

Nowadays the applicant for work literally and figuratively folds his hands as he sits at the interview counter of the Employment Exchange, the whole onus of finding him work and giving him sustenance in the meantime being upon the shoulders of the interviewing official and his department. This is all to the good; it takes much of the bogey element out of unemployment, but it also is true that a good scare may have beneficial effects upon the attitude of the individual seeking work.

Naturally the Devonport replies reached us first and in company with the involuntary acrobat of the runaway drum, I went to Devonport for an interview. We were both taken on at a wage of 38*s.* 0*d.* a week—a real affluence for a single man in those far-off days just before the outbreak of the First World War. But what with the extra cost of living in digs and paying frequent visits to Falmouth to see our girl-friends (by this time I was engaged to Lily Johns, the prettiest girl in the village of Mawnan Smith) we were probably no better off than if we had taken the jobs offered by our old firm. However, it was some satisfaction to know that we were getting the top rate for the job.

Additionally, of course, we were getting more experience on very different types of work. At Devonport we worked mainly on battleships, doing such jobs as increasing the size of the air-cooling trunks in the magazines of *Collingwood* and *Temeraire*, warships that had been built at Devonport. The smallness of the magazine cooling trunks originally fitted in this class of battleship was suspect. Stored ammunition is dangerous stuff and if high explosive gets overheated it may easily explode.

At Devonport we also did general refitting work, making moulds from which the platers could cut new plates, making up boiler cradles, or rounding up a mast. One day we might be laying the deck in a battleship and the next day laying keel-blocks on which a ship would rest in dry dock, or shoring up with heavy timbers a ship that had already come into dry dock.

Away from home, there was little enough for a single man to do in the evenings except racket around the town, and after due experience of this sort of thing I came to the conclusion that it was a waste of time and money, more particularly time. I suppose I was just about intelligent enough to realize that I was ignorant, that I had left school too soon. At all events I was constantly being irked by my lack of knowledge in subjects outside my trade, so I decided to utilize the spare time that hung so heavily on my hands by continuing my education.

My choice fell on a correspondence course in general illustration, which seems perhaps a surprising selection for a horny-handed shipwright, but which, actually, was a natural choice for me because I had always been interested in sketching and pictorial art generally. Besides teaching me the basic principles of drawing, design, and perspective, this course also expanded my mental horizons and at the end of two years' study, when I had gained my diploma, I felt that I had done something really worth while. Apart from money directly earned from the sale of water-colours and oil-paintings and the pleasure derived from filling the pictorial needs of the houses of my married children, the course provided me with a pleasant hobby, and my natural and acquired skill in sketching was, on occasion, extremely useful to me in my eventual vocation.

One day at Devonport, Charlie Tooley and I, together with another shipwright, Claude Williams, of about our age, were working on a catamaran alongside the *Hebe*—a naval gunboat—taking the bolts out of the boat davits. A catamaran or " fish " is simply a floating stage. The bolts we were working on terminated in three-inch nuts and as the *Hebe* had been at sea for quite some time before her present refit, most of these nuts were solidly rusted on to the bolts, and it was therefore impossible to turn them with a wrench without some preliminary treatment. This consisted of heating the nuts with a naphtha lamp, to make them expand a little. This lamp was a rather clumsy bucket-like contrivance which was probably the forerunner of the modern blow-lamp. My job was to heat the nuts and after they had been removed to pick them up with a pair of tongs and quench them in the water at the end of the " fish ".

In the corner of the dock where the *Hebe* was lying there was the usual accumulation of floating rubbish and seaweed that may be seen in the corners of almost any dock. As the deck of the " fish " was almost flush with the water, this rubbish had spread over the actual deck rendering it difficult to see exactly where the wood ended and where the water began, and to make the camouflage complete it had been snowing heavily so that there was an unbroken surface of white. Picking up a red-hot nut, I ran along the " fish ", misjudged its length owing to the covering of snow, and ran straight into the water. The rubbish closed over my head and the weight of the tongs began to pull me down. Dropping the tongs hurriedly, I opened my eyes. The only daylight I could see was some distance away, so I struck out for it, eventually breaking the surface in clear water.

Owing to the continuous roar of the naphtha lamps neither Tooley nor Williams had heard the splash as I went overboard; indeed neither of them had noticed my absence. I climbed back on to the "fish", combing the seaweed and dock refuse out of my hair as best I could with my fingers.

" Good Lord!" exclaimed Tooley when he saw me standing there dripping. " Darned if you weren't born to be a diver."

Claude Williams pricked up his ears.

" What's all this about being a diver?" he asked. Then Tooley told him the story of my previous escapade. We had no time then for further discussion of the subject because the superintendent, who had seen the accident from the other side of the basin, came hurrying towards the *Hebe*.

" Are you all right, Chard?" he asked.

" Quite all right, sir," I replied. " I just misjudged the end of the ' fish '. I'm afraid, though, that I've lost a pair of tongs and one nut."

" I daresay the dockyard will survive that loss," he laughed, " but you'd better go along to see the medical officer."

My visit to the M.O. was brief.

" Hello, Chard," he said. " What's all this about? Is Plymouth Argyle playing a mid-week match today?"

" Not that I know of, sir," I laughed. " Just a plain accident. No damage."

" None at all," he agreed, after examining me. " In fact, you're disgustingly healthy. However, you might as well take the afternoon off."

Claude Williams tackled me again that evening.

" Are you really interested in diving?" he asked.

" Always have been," I replied.

" So have I," he said. " Why don't we do something about it?"

" But what can we do?" I asked. " The only way to become a diver so far as I can see is to join the Navy, and even then we couldn't be certain of getting ourselves sent to a diving school."

" Well, let's join the Navy, anyhow, and take our chances," he suggested.

" But I'm married now," I said, " and I've not long since set up housekeeping in Townsend Avenue, Keyham."

"Well, I'm married, too," shrugged Williams. "*What of it?*"

Of course, we knew these facts about each other. We merely repeated them by way of considering pros and cons.

"I don't know what my wife would say," I observed.

"Don't tell her until after you've joined," he advised.

Early in 1914 the Royal Navy, doubtless anticipating trouble with Germany, was conducting a vigorous recruiting campaign. There was no call for any dockyard shipwright to join up because he was practically in the service already, and in any case he would be more valuable to the Navy, should war break out, as a dockyard shipwright helping to build, maintain, and repair ships of war, than as a naval rating doing ordinary ships' chores.

A few days after this conversation with Williams, war broke out. That decided us. On 21 August, 1914, without telling our wives beforehand, Williams and I joined the Royal Navy on 12-year engagements.

Chapter 4

DESTINY AND SCAPA FLOW

THE Royal Navy has its routine of drill and physical training. I almost wrote "necessary routine", but I thought better of that; some things are certainly not necessary. No matter how specialist a man's job afloat may be, even if it is as non-combatant and sedentary as that of a paymaster's writer, his state of physical fitness has to be tuned up on enlistment and he has to learn enough about the elements of drill to be able to take his place with others on formal parades and ceremonial occasions.

One of the first things he has to learn is how to salute an officer. This, in my opinion, is one of the unnecessary items, but even supposing that no war could possibly be won without saluting, is it really necessary to analyse the salute right down to finger and arm movements and positions? Civilians may well be forgiven for innocently supposing that one demonstration of the correct way to salute would be sufficient. Not so! The naval salute must be a thing of precision and exactitude. According to the Manual of Seamanship, the naval salute is made by bringing up the right hand to the cap, naturally and smartly, but not hurriedly, with the thumb and fingers closed together, elbow in line with shoulders, hand and forearm in line, with the palm of the hand turned to the left but inclined slightly inwards.

Incidentally, in my copy of the Manual of Seamanship, dated 1915, there is a typographical error, the word "figures" having been wrongly used for "fingers". This mistake, in the middle of a painfully precise description of a manœuvre so simple that a child could learn the action in one attempt, strikes me as being funny. I wonder whether their Lordships of the Admiralty have discovered the error yet.

So in August 1914, with a major war against a strong sea-power already declared, we recruits still had to go through all the minutiæ of preliminary training, although most of us could much more profitably have spent this square-bashing period in learning how to handle boats, how to swing the lead (actually), how to box the compass, and so on. Recruit-training assumes that all men are equally below par physically and equally ignorant, so that the fit and the knowledgeable have to go through the boredom together with the fat and the ignorant. After six weeks on the square at Devonport, Williams and I were sent north to Scapa Flow in the Orkney Isles, apparently following the principle well recognised in all the Services, that of basing a man as far away from his home as possible.

At Scapa we joined the *Cyclops*—a supply and depot ship which had been anchored for so long in the same place that, like a bachelor's houseboat, she was virtually riding on empty tins. In the *Cyclops* we became friendly with a young blond-haired Scot from Inverness named Wilson, whose nickname was inevitably " Tug ".

In the *Cyclops* we began to learn about the ways of the Royal Navy—and what a lot there is to learn! Naturally we three played tricks on each other, and the first of these was, of course, the old hammock trick. Tug Wilson fell for it. He did not care overmuch for hammock sleeping. Personally I preferred a hammock to a bed. The slung canvas gives to every movement of the body and when the ship is at sea, the hammock remains reasonably still, no matter how much the ship rolls. I think it is almost impossible to sleep comfortably in a bed or a bunk in a ship in rough weather. The body is constantly rolling from one side to another and the most I can ever do in such circumstances is doze. In a hammock the body does not feel the rolling of a ship, although some of the pitching motion is transmitted.

We increased Tug Wilson's dislike of hammocks one night by tying him a slippery hitch. Tug was usually late in scrambling into his hammock. Like a woman's, his night preparations took him a long time, and on this occasion it was well after " lights out " before he tried to climb into his hammock. The slippery hitch gave way immediately and deposited Tug on the deck among a chaos of lanyards and bedding. Then, swearing strange Scottish oaths hardly comprehensible to our Sassenach ears, he had to secure his hammock with a Blackwall hitch—not an easy thing to do in the dark for a novice in knots and hitches—and re-make his bed. As a result of this incident, Tug became acquainted with the scran bag, because in the spill he lost his folding comb, which he was always passing through his fair hair. The comb later turned up in the scran bag, a depository for personal gear that is left lying about on board ship, from whence Tug found that he could only redeem his comb by paying the customary tribute of a piece of soap.

The *Cyclops* loaned us to various ships to fill temporary vacancies. It was rather an aimless, purposeless sort of life for two ambitious young men who had joined the Navy, originally, with a definite object in view. The only redeeming feature of our existence in the *Cyclops* was that we were continually learning something, although it was not the special something we wanted to learn. In view of the national emergency we had temporarily put aside our personal aspirations. We had, of course, made formal application, Williams and I, to be considered for a course in diving, but we thought it unlikely that this request would gain much attention in wartime. After all, the Navy had more than enough to do to win the war at sea, without bothering about the personal ambitions of two insignificant ratings. We fully expected that nominations to diving schools would be suspended for the duration.

Tug Wilson did not share our diving aspirations. "Not for me!" he declined, when we suggested that he might like to put his name down with ours. "Maybe I suffer from a mild form of claustrophobia.

I couldn't stand the boxed-in feeling that a diving-suit, or a submarine for that matter, would give me. I feel safer in a ship."

"There's no back door at sea, anyway," observed Williams, thoughtfully.

"No," agreed Tug, "but you've one more chance on the surface than you have down below. I've got the chance of an exchange with a fellow in the *Vanguard* and I think I'll take it. There's a fine ship, now, a ship you could be proud to sail in. I believe I could fix exchanges for you two as well."

"H'm!" I mused. "If there are three ratings in *Vanguard* anxious to transfer, I'd want to look pretty carefully into their reasons. They may not be as personal as they would try to make out. What do you think, Claude?"

"Well, it would certainly be nice to settle down to a more-or-less permanent job in a seagoing ship," replied Williams, "but, after all, the *Vanguard* is based on Scapa and that's a hell of a long way from home for us. The *Vanguard* will be just fine for Tug because she's based practically on his doorstep, a mere hundred miles or so from his home town, but she wouldn't have any such advantage for us. There's still an outside chance that we might get sent to diving school, so unless a transfer to a Pompey or Plymouth ship happens along, I think we might as well stay put in the *Cyclops*."

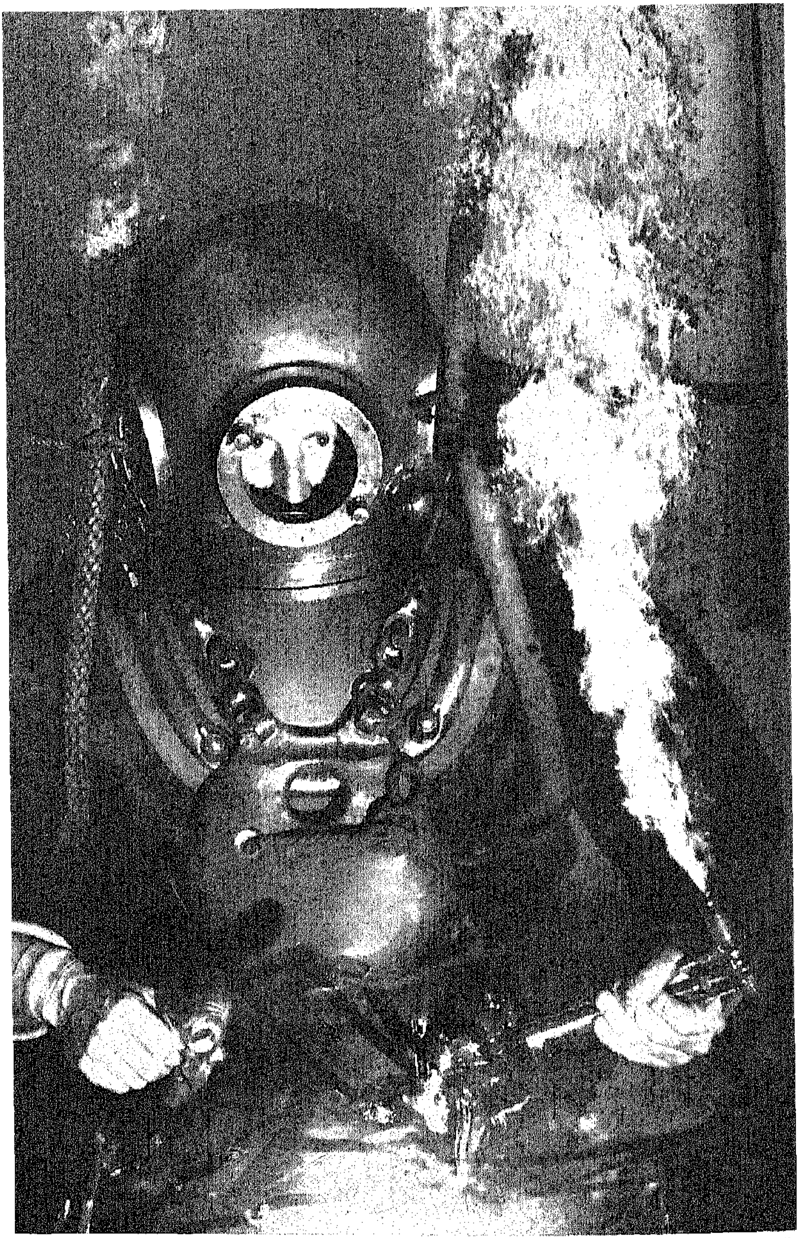
So, after a few weeks, Tug Wilson transferred to the *Vanguard* and that turned out to be a momentous decision for the likeable young Scot.

You could hardly call me a fatalist but I can't help wondering sometimes just what would have happened if Williams and I had transferred to the *Vanguard* along with Tug Wilson. Maybe nothing! Maybe we would have been members of the crew of the liberty boat from the *Vanguard* that went off to fetch the officers who had gone to a concert aboard the *Royal Oak*. Maybe we would have arrived at the next turning-point in our lives just the same but by a different route. Maybe the fate that overtook Tug Wilson as a direct result of the transfer would not have overtaken us.

I suppose everyone will agree that all human beings have certain lines of destiny. Personally I cannot make up my mind whether these lines, or some of them at all events, are laid out in advance or whether we simply leave them behind us as trails in space and time. The laying-out in advance of billions of lines of destiny, crossing and recrossing each other, with certain developments accruing at each junction, seems to be a pretty tall order. Perhaps I should say *seemed* to be a pretty tall order. Nowadays with electronic machines like LEO calculating the new P.A.Y.E. tables for the Inland Revenue in a matter of hours, and ERNI flashing out winning numbers in the premium bond draw at pure random, tall orders of this sort are certainly cut down in stature. Indeed one can conceive that the pre-arrangement of lines of destiny to produce certain events is, notwithstanding its vast size and scope, a mere routine job assigned to some celestial electronic brain.

There is a third possibility—that lines of destiny are not laid out wholly in advance but that some of them have slight forward projections at each junction, their ultimate bent depending entirely on ourselves. Certainly we can all reach back into our past and put our finger on certain turning-points which, had we taken the alternative route, would apparently have made a tremendous difference to our destinies. Or is O. Henry's ingenious idea the correct answer, that no matter which alternative route we take, we eventually reach the same inescapable climax at precisely the same time.

My big turning-point was my decision to join the Navy. It was a momentous turning-point for Williams too, but after we had travelled together along this particular road for a time, our routes diverged. Had I not joined the Navy, I should probably have spent the rest of my life in the dockyard at Devonport, because once you get settled in a job of that type you do not change very readily. I should possibly have remained in the same house in Townsend Avenue, a street which was completely obliterated by the Germans during the Second World War. As things were, my posting to Scapa Flow resulted in the breaking-up of our home in Devonport, my wife returning to Falmouth. Admittedly it is a long time between 1915 and 1940. All sorts of things might have happened to cause me to leave Devonport during that period, but when a district in which you have once lived is wiped out overnight, and nothing is left of the house or street that you lived in but rubble . . .



FOX

Taking the plunge!

I can put my finger on closer parallels. Tug Wilson eventually transferred, as you know, to *Vanguard* with what results we shall see. Claude Williams eventually went to *Indefatigable* on a job that should have been mine, a posting that certainly would have been mine had not a certain Irish knight decided to turn traitor . . . but now I really am running too far ahead of my story.

Really I suppose all speculation about lines of destiny is quite fruitless because it is all part of the great riddle of the universe. Everyone who has survived two world wars can almost certainly indicate half-a-dozen turning points where the alternative route led to almost certain death; and the shorter the alternative route, the more dramatic the escape seems. The trouble with this sort of speculation is that it feeds the individual's ego with a false sense of importance. He is bound to ask himself the question, "Why was I saved?" and he usually flatters himself in the answering of it, although if the truth were known, his escape from death is no more momentous in the scheme of things than the last-second escape of a grit-pecking sparrow from a speeding car. I guide my thoughts severely along these lines whenever I am tempted to succumb to the private fantasy —common to all of us, I suppose—that providence has a special interest in my fate.

Fortunately the monotony of life in *Cyclops* was broken by the advent of an interesting and intriguing job, the fitting-out of the first Q-ship. This was the *Prince Charlie*—a 2,000-ton coasting vessel. We fitted canvas bulwarks across her well-deck. These could be knocked aside at a moment's notice, exposing guns ready for action. The whole vessel was camouflaged with canvas painted to represent a deck cargo of stacked timber. The first Q-ships were very successful, knocking out many submarines, but soon U-boat commanders grew wary and developed the simple technique of sinking the ship first and asking questions afterwards—if they happened to pick up any survivors. In effect it was probably the decoy-ship trick that induced the Germans to adopt the tactic of unrestricted attacks on merchant shipping. Eventually the Germans would probably have reached the same point by another route, but I think it was the Q-ships that gave them the excuse for all-out warfare on merchantmen. Our Q-ships annoyed the Germans exceedingly. In war, the German is a great hand at laying booby-traps and like most practical jokers he does not like japes at his own expense.

After completing our hush-hush work on the experimental *Prince Charlie,* Williams and I hung on at Scapa Flow for another four months doing our chores in *Cyclops* and learning more and more about the thousand-and-one trivia of life at sea, constantly tempted to end our state of indecision by offering ourselves for transfer to other ships. I suppose if two of these offers had come along simultaneously, Williams and I might have accepted, but as it happened they always came singly and we refused them because we did not want to separate. Strange how we human beings tend to cling together—men no less than women. In company with someone else we find comfort and support and will attempt things that, alone, we would not essay.

Then one day in December 1915 came the welcome news that Williams and I had been provisionally accepted as pupils by the Naval Diving School at Devonport. Welcome news, indeed, and not merely because this was the threshold of our ambitions, but for the prosaic reason that Devonport was so much nearer home. As far as home waters are concerned you cannot be sent much further away from Falmouth than Scapa Flow. Week-end leaves were simply not worth having. Seven-day leaves were more than halved by travelling time. Such mundane considerations count to a surprising extent in everyday life.

Undoubtedly the acceptance of our applications, which might quite easily have been shelved in some official pigeonhole for the duration, was due to the intensification of the U-boat warfare, combined with the fact that we were qualified shipwrights. Merchant ships were being sunk at an alarming rate, so fast indeed that the Admiralty had to consider the idea of some sort of salvage arrangements. Any such plan would involve the training of more divers, shipwright divers, men who could go down and work on the submerged hull of a ship. Actually neither Williams nor I were ever employed on salvage work during our naval service, but I think it was this foreseen need for men who could do salvage work that led us to the Devonport Diving School.

Diving, *per se,* is nothing except a means of getting to an otherwise inaccessible spot. Basically it is as trivial and unimportant as a Chinese back-scratcher. Any ordinary healthy man, or woman for that matter, can put on The Dress and take a dip, but what can he do down below except walk around and admire the scenery, if any? Nothing, from the naval angle, except routine jobs like looking for a case of quince jam that has been dropped overboard in loading more by design than accident, searching for practice torpedoes that have failed to surface, and so on. The Royal Navy can always lay its hands on a surplus of search-divers, but the really valuable man, in much shorter supply, is the diver who can do a skilled job under water. The difference between artificer-divers and search-divers is reflected in the different rates of pay. At depths of more than 25 fathoms (rarely reached in naval diving, by the way) the rate of pay for an artificer-diver was, in those days, 15*s*. 0*d*. for the first hour and 5*s*. 0*d*. for every subsequent half-hour, for search-divers 12*s*. 0*d*. and 4*s*. 0*d*.—a difference of 25 per cent in favour of the skilled man.

So with hope and expectation running high, we said good-bye (for ever, we hoped) to Scapa Flow and reported to the Gunnery Captain at Devonport. Of course we still had to pass the stiff medical examination for aspirant divers, but as we had already passed a provisional examination at Scapa, we did not think we had much to fear from this.

Chapter 5

THE "BENDS"

TWELVE aspirant divers, all slim young men under 30 years of age, lined up for the medical examination. They had all been passed by their commanding officers in the ships or depots they came from as steady men of good character, not addicted to alcohol, capable of sustaining considerable bodily *strain and able to swim.*

They had to be slim because the Royal Navy will not accept a fat man as a diver, or even a man with a tendency to put on fat. Indeed, the Navy prefers men on the skinny side of average build as recruits for diving. The reason for this is that experience has taught the authorities that caisson disease (more commonly known as "the bends") is more liable to attack fat men. Why? No one knows precisely! Possibly because they have more area in which the damaging nitrogen bubbles can lodge.

The swimming requirement may well seem as peculiar to you as it did to me, since the wearing of heavy weights on the chest plus lead-soled boots weighing 18 lbs. each is obviously not conducive to efficient swimming. During the course of our first lecture I asked one of the diving instructors about the reason for this.

He told me that the regulation was made because divers, even more so than ordinary ratings, are constantly ferrying about in small boats and are therefore more liable to experience an occasional ducking. The navy would undoubtedly like all ratings to be able to swim, but to insist on that would be asking too much. However, they can afford to be choosy when they are selecting divers, so they make it a rule that non-swimmers will not be accepted for diving school. Actually, when you get under water, you find it safer to keep both feet on the sea-floor.

Years later, though, I often used the art of swimming in my underwater work. Just as mountain climbers may take a short cut, not without risk, by jumping over a crevasse in the snow, so have I swum, in full armour, over a crevasse or hole in the ocean bed, or from one sunken submarine to another, to save myself the trouble of clambering down and up again. The trick lies, of course, in the realisation that a diving-suit has built-in water-wings, the air pressure in which can be increased by screwing down the outlet valve on the helmet. You have only to increase your buoyancy slightly and the weight of the equipment disappears, rendering a short swim under water a fairly easy proposition.

As far as addiction to alcohol is concerned, while the majority of divers are temperate men at the outset of their careers, quite a number learn to raise their elbows after they have been diving for a few years. I believe the reason for this may be psychological. Diving involves not only considerable bodily exertion but also quite a lot of nervous strain. Just as air-pilots may suffer from aero-neurosis, a complaint believed to be caused by the excessive expenditure of nervous energy required to repress the inherent basic fear of falling, so I suppose divers must expend nervous energy in overcoming the inherent basic fear of drowning. At all events it is a fact that some divers do, in later life, hit the bottle. As for myself, I was fortunate in never having any inclination either to drink or smoke, and probably the little extra edge of physical fitness so gained was extremely useful to me on some occasions. But don't imagine that I kept in strict physical training just because I was a diver. My abstinence from alcohol and tobacco was purely fortuitous.

It certainly was a stiff medical examination, nothing like the "Say 99!" "Cough!" "All right, you're fit!" routine that became a standing joke during the 1914–18 war when, in the later stages, the bottom of the manpower barrel was being scraped. In addition to the ordinary auscultation and percussion of heart and chest, the testing of sight and nervous reflexes, there was also a blood test, and a particularly diligent search for varicose veins or any sign of their incipience, presumably because such sign would indicate that the man's circulatory system might not stand up to pressure. Special attention was paid to the ears, a slim electrically-lighted instrument being poked to what felt like dangerous depths into the orifices.

Two of the aspirant divers were failed because their Eustachian tubes were not clear enough for diving. The slightest stoppage in these tubes will cause the diver intense pain as he descends. In fact, if he cannot clear the stoppage, which may be nothing more than a tiny speck of wax, the pain will force him to check his descent. These two failures were plain unlucky. After all, it was mid-December and anybody might be liable to have a waxy secretion in one or both ears. The two failures could probably have got through if their ears had been syringed beforehand.

The whittling-down process had begun. After the medical examination there were only ten aspirant divers and the subsequent course of events reminded me irresistibly of the ten little nigger boys. For the next fortnight, a period which was spent in listening to lectures from the diving instructors, Jimmy Reed and Sammy Shields, both spare men in their forties, teetotallers and non-smokers, there were no more failures, nor any withdrawals. The instructors did not in any way glamorise what lay ahead. In fact it was quite the reverse. Some of their lectures were enough to frighten the life out of anybody with a nervous disposition. Their theme song was that the sea was an enemy against whose manifold tricks constant care and watchfulness would be necessary.

At all times emphasis was laid on the voluntary nature of our undertaking. Any man could withdraw at any time without giving any reason for his withdrawal. Of course, there was a certain amount of indirect pressure, not stemming from the instructors or the school, but from the group itself. We were ten healthy, high-spirited young men and no one of us wished to appear inferior to his fellows. So far as the school was concerned, no reason for withdrawal was necessary, but among ourselves it would be almost essential for a backslider to say why, even if the reason given were merely an excuse to cover up his actual phobia.

Both Reed and Shields were first-class instructors, although perhaps their true excellence did not appear until they actually put us down and, literally, held our hands while we were learning to walk in the strange new world at the bottom of the sea. In the lecture room their talks had a certain parrot-like quality as though they had swallowed the Diving Manual whole and were now disgorging it piecemeal and predigested for the nutrition of their fledglings. We took notes, copious notes, but in actual fact there was no real need to write down a word because everything they told us in the line of basic facts was already written down in the Diving Manual, which was accessible to us. The interesting though not necessarily informative parts of their lectures were the illustrative anecdotes drawn from their personal experiences.

Early in the course we learned about fresh air and foul. Fresh air comes in through the inlet valve and this also mixes with the air in the diver's suit. What goes out through the outlet valve is mixed foul and fresh air. Undoubtedly the diver breathes air with a greater concentration of carbonic acid gas in it than he would breathe at the surface.

The design of the helmet and in particular the positioning of the inlet and outlet valves is such that the outlet air contains the maximum achievable amount of carbonic acid gas. But the arrangement works in practice. It is possible for a diver, however, to experience CO_2 poisoning.

The first effect is marked panting and acute headache, and if the concentration of CO_2 increases this would be followed by faintness, by extreme distress in the chest rather like an attack of angina pectoris, finally loss of consciousness resulting in death.

On such occasions the diver must stop working at once, and either sit down or kneel down, bending his head towards his knees. He should also signal for more air, in case the topside men have accidentally slowed down on pump delivery. If these preliminary measures produce satisfactory results, the diver can remain below and resume work as soon as he feels like it. If not, he should return to the surface and take a breather.

CO_2 poisoning is more likely to occur in deep water. As a diver goes deeper, although the concentration of carbonic acid gas may remain the same, its effect increases. At 33 feet, 1 per cent of CO_2 has exactly the same effect as 2 per cent would have at the surface. This means that a diver working at 180 feet would, even if he were breathing pure air pumped directly into his mouth or nostrils, feel as though he were working in a concentration of ·2 per cent carbonic acid gas. This would have little effect on him, but he would have to breathe more deeply and he would begin to feel tired sooner. But the air breathed by a diver is not pure air. Let us suppose it is 1 per cent impure, then at 25 fathoms its effect would be equal to 7 per cent, and that would produce symptoms. Symptoms would also be produced if the pumps failed to deliver sufficient fresh air. At the surface a diver needs only 1½ cubic feet of air per minute, but at 200 feet he would need 10½ cubic feet per minute, and that's a devil of a difference. Divers are very much in the hands of their topside men, and that's why the Navy prefers to have men with actual experience of diving working on the pumps.

Chapter 6

THE SQUEEZE OF THE SEA

DIVERS rarely drown. There have been a few cases, of course. In one instance a careless attendant forgot to turn down the locking stop on the helmet into its recess. The helmet is screwed on to the corselet by only one-eighth of a turn, so that obviously if the locking stop is not turned down, and the diver spins round in the opposite direction to the thread during his descent, the helmet could easily unscrew. This is precisely what happened. The top of the helmet is held to some extent by the air-pipe so that it cannot twist as much as the diver himself.

Pressure is the diver's main enemy. The basic working principle of The Dress is inflation; air pressure against water pressure; air pressure to protect the diver from the squeeze of the sea, the fatal embrace that may catch an unwary diver, or even a wary diver if some unavoidable accident befalls him. " Squeeze " is no mere figure of speech, but an actual and literal fact. If, at depth, you allow the inflation of the suit to fall below the safety point, you will soon feel the hard pressure of the sea, first against your legs. If the suit deflates suddenly, perhaps owing to a tear in the fabric, enormous pressure is at once applied.

Most of us think of ourselves as living in a world of no pressure. We do, however, notice changes of pressure to some slight extent, as when we climb a mountain or descend a deep mine. The chief physical symptom is a popping of the ears. This is because the channel of air communication between the ear drum and the interior of the head is narrow, and frequently obstructed to some extent so that the pressure change has to force its way through.

Water is much heavier than air and exerts correspondingly more pressure. Every square foot of a diver's dress and helmet has to withstand an *additional* pressure of nearly one ton for every 33 feet of descent. At a depth of 30 fathoms, the pressure per square foot is about 6½ tons. You may wonder how it is that a comparatively flimsy material like one-eighth inch sheet rubber, even although it is reinforced on both sides with twill, can stand up to such terrific pressures. As long as the pressures inside and outside the suit are equal, there is no strain whatever on the fabric.

A pressure accident can happen if the air pipe becomes detached from the helmet, or if the air pipe were severed, but those are outside possibilities. More likely is the chance of a fall by a diver from shallow water into deep water. He steps back for some reason or other, misses his footing or trips, and falls off the stage. It is another 33 feet to the bottom, and when he gets there, which will be in a matter of seconds, the pressure is twice what it was at the point where he was working. He therefore gets another 2,000 lbs. of pressure rapidly applied to every square foot of his suit. The helmet, being of metal, is not likely to give way, and the pressure attacks the weakest part of the suit. The diver's body is remorselessly squeezed upwards, or downwards if he lands on his head, into the helmet. He will probably be killed instantly.

Such an accident could not happen if the attendants had been keeping check on the diver's lines.

The immediate way of correcting a deficiency in air pressure is by the outlet valve, this being the only adjustable valve in the helmet. To keep The Dress inflated, air is pumped into the helmet and the diver has to regulate his outlet valve so that the pressure in the suit is always slightly greater than the water pressure outside. As may well be imagined this needs a considerable amount of practice before a diver can make a fast descent. Indeed, he cannot make a fast descent without the closest co-operation from his top-side men. As the diver goes down, the pump hands must deliver an increasing volume of air during the descent, and deliver it against a rapidly increasing pressure, so that the physical labour involved is quite hard. At a depth of 66 feet, a single cylinder pump is no longer able to supply the diver with sufficient air and a second cylinder has to be switched on. At 132 feet four cylinders are required and at 200 feet six cylinders are necessary to supply one diver.

The correct inflation of the Dress makes all the difference to the working comfort of a diver. If the suit is blown out too much, the diver becomes too buoyant and, additionally, has greater difficulty in bending his arms. This makes whatever job he is doing that much harder. At one point of excessive inflation he becomes so buoyant that he cannot remain on the bottom unless he holds on to something. That benefits him not at all because by this time his rubber sleeves are so ballooned out that he cannot bend his arms at all and is therefore unable to reach his exhaust valve. Sooner or later he has to let go, and then he shoots to the surface like a cork, taking his chance as to whether he hits the keel of the diving-boat or anything else that may happen to be in the way. As he rises, the decreasing water pressure increases the inflation of his suit, accelerating the speed of his ascent. For the last few yards he will be travelling like an express train. Fortunately The Dress is not likely to burst because it has a built-in safety valve. At excessive pressures, the suit begins to blow at the cuffs.

Chapter 7

INTRODUCTION TO THE DRESS

AFTER a fortnight in the lecture room followed by a viva voce examination designed to find out just how much we had, or had not, absorbed, we were at last introduced to The Dress. In the Royal Navy learning to dive is a slow laborious business which follows a rigid set of rules and regulations drawn up mainly for the protection of divers. Naturally there is some red tape. I suppose it could hardly be otherwise. I doubt if anyone could draw up a set of rules covering all the possible emergencies that might arise in deep-sea diving without introducing a few that seem fatuous and more likely to be honoured in the breach than in the observance.

Diving is a major defiance of the laws of nature and whenever man enters an alien element he puts himself in jeopardy. The Royal Navy never forgets this, taking its responsibilities to divers very seriously —hence the very comprehensive set of rules known as the Diving Manual.

We learned that a patched suit is quite safe for shallow diving, just as a patched inner tube is quite safe for ordinary cycling. Indeed, the strength of a patch bonded on properly with rubber solution is quite amazing. Just as a cyclist forgets the patches on his inner tubes, the diver forgets the patches on his suit.

The Dress is rather like a suit of sleeved overalls, made from sheet rubber covered on both sides with tanned twill. It has a double collar, the inner part of which is pulled up round the diver's neck, while the outer part, made of vulcanized rubber, fits over the breast plate. The cuffs of the sleeves are also of vulcanized rubber. They fit tightly round the wrist and the joints are made tighter still by separate vulcanized rings which are pulled on over the cuffs and wrists after the Dress has been donned.

The Underwear was a motley collection of woollen garments that looked as though they might have been picked up in an old-clothes shop. We picked them up one by one and examined them—a woollen guernsey, long woollen pants, and long stockings rather like the " operation " stockings used in hospitals.

There was too a red woollen cap. This breaks the impact of the helmet on the diver's head should he stumble. On the surface, too, with the helmet removed while the diver is resting between dips, the red colour warns all and sundry in the neighbourhood that the wearer is a diver, who is handicapped by his suit or weights, and who should therefore be given every consideration. For the same reason the diving-boat flies a red flag.

As the helmet rests on a particularly bony and sensitive part of the shoulders, protection is necessary against the edge of the metal; this is supplied by the shoulder pad. Between the helmet and the rubber part of the suit, there is a corselet or breast-plate, made of tinned copper with a specially strengthened edge. It has six brass screw-studs. These pass through metal-lined eyelets in the rubber collar and then through brass strips which are pressed down to make a watertight joint with the collar by means of thumb-screws or butterfly nuts. You don't need to exert a lot of pressure on these nuts. One hand on the T-spanner is quite enough. If you exert too much pressure you merely bend the metal and make the suit leaky for ever after.

The neck of the corselet has an interrupted screw-thread, but before the helmet is screwed on, a leather washer is fitted to make the joint watertight. The helmet is also made of tinned copper. It has an interrupted screw-thread which fits the thread of the corselet. At the back of the helmet is the locking stop which has to be turned down into this recess on the corselet, to prevent the helmet from unscrewing. You can see that the helmet has three windows. These are of strong, flat glass, half-an-inch thick, fitted into brass frames. The side glasses are oval in shape and are covered with brass grilles. The front glass, which is circular, can also be protected by a brass grille but this is usually omitted as it tends to obstruct the diver's vision.

At the back of the helmet is an elbow-piece to which the air pipe is screwed. The inner end of the elbow-piece contains the air inlet valve, through which the traffic is strictly one way. Just how necessary this one-way flow of air is can be visualized if we imagine the case of a diver whose air pipe is accidentally severed. If the air could pass both ways through the valve, all the air in his suit would escape within a few seconds and the great hammer of the sea would swing into action.

The air is tubed into the helmet in such a way—so say the experts—as to give the best possible ventilation and to diminish as much as possible the misting of the face-glass. Personally I don't think any placing of the air inlet has any real effect on either problem. Fogging of the face-glass is always a nuisance. To clear the face-glass the diver opens the spit-cock, the small brass tap let into the helmet on the left of the face-glass. Turning the tap lets in a jet of sea water. The diver turns his head, collects a mouthful, and spurts it out through pursed lips over the face-glass.

The outlet-valve is also strictly one way, otherwise water would be able to enter the helmet if the pressure inside was less than the pressure outside. This valve is so situated that it lies just behind the diver's right ear when the helmet is locked into position. This is probably not the most handy position for the diver to reach, but it has the advantage that the stream of bubbles arising from it does not obscure the diver's vision. The outlet valve is so designed that the pressure of the surrounding water keeps the valve pressed down on its seating. In fact no air can escape from the valve until the pressure inside the helmet exceeds the pressure outside—a very valuable device which saves the diver quite a lot of fiddling.

Within limits the diver can control the rate at which the air escapes from the outlet-valve. He can close it completely, either by screwing it down, or more temporarily by pressing down the spindle which projects from the valve. This is a useful device for descending. Once on the bottom the diver sets his outlet-valve by screwing it down or screwing it open until he achieves the desired pressure in his suit.

The air pipe screws on to the elbow joint. It has to be strong because it may have to serve as a life line. Apart from this consideration, it has to be tough enough to withstand a considerable amount of ordinary wear-and-tear, rubbing against the side of a diving-boat, rubbing against rough metal when the diver goes inside a wreck, not to mention snagging or fouling on unseen or unnoticed projections.

It is built up on a basic tube of rubber. There are three layers of canvas, two layers of rubber with coiled steel wire in between them, two more layers of canvas, and a final outer covering of rubber. The internal diameter of the pipe is $\frac{5}{8}$ths of an inch. It will stand up to a pressure of 200 lbs. to the square inch. That may not sound very much when you think of the pressures that obtain at great depths in water, but it should be remembered that the strain on the pipe is only the mean difference in pressure between the inside and the outside—never more than a few pounds except in very unusual circumstances.

The breast rope, or life line as it is popularly called, is not quite simply an ordinary rope of plaited hemp.

It also contains the telephone wires, which serve to give it some additional strength. The boots are made of very strong leather, with brass toe-caps and wooden soles. Leaden soles are then riveted on to the wooden soles. The boots are not only laced, but also buckled for greater security.

The weights speak for themselves. Sometimes instead of the usual weights, a special belt weighing 45 lbs. can be put on. This belt is useful for jobs where the weights might get in the way. The knife is a small but important item which must always be worn under water. It is double-edged and very sharp.

Chapter 8

TOTAL IMMERSION

IT was mid-January. There was a cold, blustery wind accompanied by occasional squalls of cold rain, one of those unpleasant winter mornings when there is, first of all, a strong temptation to stay in bed, and secondly a desire to find some comfortable indoor job in preference to venturing outside. The dark waters of the Hamoaze looked cold and uninviting. I tested the temperature with my hand: the water certainly was cold. We could all, quite easily, think of better things to do on such a morning than submitting our bodies to the cold embrace of the river.

For the last few days we had been trying on the Dress, getting used to its weight, walking about in it, training our hands to find the outlet valve and the knife at the first attempt, putting on the suit and taking it off with each other's assistance. Now we were ready to dive—or were we? Personally I would have preferred to have seen the sun shining, even a cold winter sun, on our baptism.

As we pulled alongside the diving lighter, Williams and Stevenson rowing, Instructor Reed glanced at us quickly in rapid succession.

"Who wants to be the first down?" he asked, repeating the query with his questing eyes.

"Not me," shivered Willie Jackett, the smallest man in the class, holding up his hands in the well-known Egyptian gesture of disclaimer. Indeed, there was no rush of volunteers.

"I will," I said, after a short pause.

"Spoken like a shotgun bridegroom," laughed Instructor Shields. "Well, I'll be seeing you down below."

While Shields and I were being dressed, the shot-rope was rigged—20 fathoms of 3-inch hempen rope spliced to a ½ cwt. sinker. At a point some three feet above the sinker, a lighter rope had been spliced in. This was the distance-rope that enables a diver to find his way back to base.

It took a little longer to dress me than to dress the instructor. I found it more difficult to push my feet into the " feet " of the suit, more difficult to push my hands through the cuffs of the sleeves. Apart from being inexperienced in these operations, I was a couple of sizes larger all round than the instructor: in fact they had to soft soap the inside of the cuffs to help me to get my big hands through. It was rather like trying to push one's hands through a pair of handcuffs.

With the suit at last pulled up round my neck, I sat down facing the pump, and the corselet was put on, then the boots, buckles outwards and lanyards well and truly tied round the ankles. The helmet, minus the front glass, was lifted up and Instructor Reed showed me how to test the inlet valve by inserting a finger in the elbow piece and pressing the inlet valve on its spring once or twice to make sure that it returned when the pressure was removed.

Next the air pipe and breast rope were screwed into their respective joints in the helmet, which was then put over my head and locked securely in position. Breast rope and air pipe were passed under my right and left arms respectively and tied in position at the front of the corselet by lanyards so that, in water, the pipes would hang vertically and parallel to each other in positions between the side and front glasses of the helmet. In this way a direct pull on the actual joints in the helmet is avoided. If the diver has to be hauled up, most of the pull is taken by the loops under the armpits.

Instructor Reed detailed Willie Jackett and another pupil for pump duties, while Williams and Stevenson took charge of the air pipe and breast rope respectively. Their job was to pay out these lines of communication, keep them reasonably taut, and be attentive to signals. Willie Jackett heaved a few turns on the pump to make sure that it was working properly. The hiss of the air as it rushed through the inlet valve was loud in my ears, but the sound was most reassuring.

" Out on to the ladder," ordered Instructor Reed.

Walking like a man with magnets on his boots and feeling as though I weighed a ton, I climbed over the gunwale on to the ladder where I stood waist-deep in the gurgling water, while my chest and back weights were placed on. The chill of the water seemed to strike right through the suit and the underwear. Instructor Reed satisfied himself that the weights were properly tied, the lanyards brought up over hooks in the helmet, rove through rings in the front weight and secured with a bow hitch, the long lanyard brought round the waist, through the thimble in the front weight, and secured on the left side by a reef knot.

"Heave on the pump," he ordered, "and keep heaving."

The pump hands obeyed with alacrity, although they were too interested in watching the expression on my face to pay any visual attention to what they were doing. They should have been watching the pressure gauge on the pump. However, it did not matter because the necessity for keeping tab on pressure does not really arise until the diver is actually under water.

Instructor Reed screwed in my glass and finally closed me in. I had never suffered from claustrophobia in the slightest degree, but now I at once felt boxed in, isolated, shut off from the world. I was not only boxed in, but incommunicado, except for a few entirely inadequate (so they seemed at that moment) signals by breast rope or air pipe. Certainly I knew the signals well enough, but suddenly they seemed to be a very poor mode of self-expression.

The instructor tapped me on the helmet. I went slowly down the ladder until my head was only just above the surface, took a last look round, grinned with feeble cheerfulness at the popping eyes of Willie Jackett, who was staring at me with fascinated interest, and then down three more steps where I paused again, this time completely submerged. Groping cautiously, I found and pressed the spindle of my outlet valve. This stopped the stream of bubbles and enabled Instructor Reed to see whether there was any leakage from the suit. After a few moments I felt another tap on the helmet, indicating that everything was all right. I turned, groped for the shot rope, found it, and launched myself off the ladder into deep water—well, not very deep—about 5 fathoms.

Frankly I felt terrible and yet, at the same time, keenly interested. The sense of isolation was unbelievable. As I descended deeper and deeper into the alien element it grew darker and darker, the greenish tinge of the water slowly turning to black. At ten feet I began to notice my ears but a quick swallow soon relieved the strange feeling that was developing in them. It seemed an age before I reached the bottom, although the actual depth was only 30 feet. At last my feet landed in soft mud and stirred up a foggy cloud. This soon cleared away in the ebb-tide, but it was still pretty dark down there—definitely well past lighting-up time by standards above. I transmitted the " All's Well " signal—one pull on the breast rope. Then a weird shape loomed up in front of me.

For a moment I wondered what the dickens it was, until a firm hand grasped mine and I relaxed my iron grip on the shot rope. I was still reluctant to let it go altogether, but Instructor Shields gently detached my fingers. Still holding my hand, he started walking away from the shot rope and perforce I had to follow. I found myself a trifle too buoyant and stopped for a moment to adjust my outlet valve. At the first attempt I overdid the adjustment and only succeeded in making myself too heavy, with the result that my shuffling feet stirred up great clouds of mud. I stopped again and readjusted the valve, this time hitting a nice balance.

I began to take an interest in my surroundings, but it was all rather disappointing, not at all like the pictures I had painted in my mind. Visibility was limited to a few yards and within the range of vision there was nothing to see except dark and somewhat dirty green water. There was not even any seaweed. Apparently the heavy tread of countless pupil divers in that particular spot had worn the undersea lawns bare. All the fish had been frightened away, too; there was not one to be seen. The water was cold, damned cold, and I could feel my hands gradually getting numbed.

We walked for about 20 yards, presumably to the end of the distance rope, and then back again. I should have been entirely lost without someone to guide me. On the surface I have a pretty good sense of direction but in this strange world I did not even know whether I was going or coming. There was little tide as it was practically slack water. We reached the shot rope again and the instructor tapped my helmet, which meant that I was to go up. I remembered to give the appropriate signal, four pulls on the breast rope, and then I began to climb the shot rope, increasing my buoyancy slightly to make the climb easier.

I clambered on to the ladder—a very welcome sight when it came into view—and my helmet broke the surface. I stood waist deep on the ladder while my face glass was removed. My attendants stopped heaving on my pump and assisted me into the boat. There my helmet was removed.

"What's it like?" asked Willie Jackett, with fearful curiosity.

"Not bad," I replied non-committally. Truth to tell I had not yet had time to sort out my impressions. I was not quite sure whether I was going to like diving or not, but of one thing I was sure, I was more interested in it than ever: it had a certain fascination about it that had nothing to do with living.

Chapter 9

LIVING UNDER WATER

SLOWLY and sometimes not too surely we learned how to live and work under water. It was absolutely the worst time of the year for learning to dive and this probably accounted to some extent for the 50 per cent of withdrawals that the class eventually suffered. It was dark and cold down below—bitterly cold. A little sunshine above might have lightened the darkness to some extent, but it was hardly to be expected in January. In docks, harbours, and river estuaries where most British divers learn their trade, the winter visibility is almost nil at a few fathoms down and at anything over 20 fathoms Erebus itself is rivalled. So the English diver learns to work mainly by touch. This has one unexpected advantage at least: when necessity or emergency arises, a British diver has no qualms about going down at night: it's all one to a touch-trained man. Even submersible lights, operated in clusters from a battery in the diving-boat, are not much good, night or day, in thick muddy water. In my apprentice days the only form of light available to us was a hand-torch operated by a dry cell. This shed a feeble, short-sighted glow over a small circle and filched the use of one valuable hand. This type of torch was naturally useless for large scale survey work but it did enable a diver to size up a small job at close quarters. To do any actual work on the job, however, the torch had to be laid aside. We rarely used torches at Devonport.

The disadvantage of working by touch is that the diver cannot wear gloves. This is fine in the summer, but in winter the exposure of his bare hands to bitterly cold water for a couple of hours at a stretch eventually results in complete loss of feeling in them, particularly as the flow of blood is restricted at the wrists by the tight rubber cuffs and rings.

Cold feet did not produce any more failures but cold hands did. One pupil, possibly with slightly defective circulation, found that he could not stand immersion in cold water. He persevered, but after a fortnight of misery he eventually gave up. I'm quite prepared to admit that Williams and I sometimes thought and talked about withdrawing, but we stuck at it.

We were always fairly warm just before we went down. Either we had just finished rowing the diving boat out to the lighter or else we had just finished a turn on the pumps, or else we had been busy sharpening tools for subsequent use under water. There was always plenty of work available to keep the topside men warm.

The first major departure from the pattern of the first dive was the transfer of the stray-rope from the instructor to the pupil. It took quite a time to learn how to balance the pressure between the deflation that enables the sea to exert its pressure and the inflation that renders a diver too buoyant.

Williams had far more trouble with his ears than I did. I soon learned the precise depth at which I could expect my ears to pop, and after a momentary check at that point to allow them to do so, I could go down further to any depth like an express train. Williams always experienced a fair amount of pain in his ears and had to hang about on the shot rope for several minutes, yawning and swallowing hard in an attempt to persuade his ears to pop.

An annoying, but, in retrospect, quite amusing, thing that happened to me in later life was to be sent down with a wasp in my helmet. I suppose it must have been inside the helmet when it was put over my head, but it did not advertise its presence until I was on the bottom in 7 fathoms. A dredger which was on its way to the River Plate had put in at Falmouth to escape the weather, but there was a terrific gale during the night and the dredger sank off St. Mawes. She could not be salved so she had to be blown down, i.e. explosives were used to break her up into small pieces, and especially to destroy her superstructure, so that she would not be a danger to shipping. I was sent down on a lovely summer day to inspect the results of the blowing down. I suppose the air pressure in the helmet stirred the wasp into activity. It started buzzing about, flying just in front of my nose and sometimes colliding with it, banging into my face glass, and sometimes settling on the back of my neck.

I waited awhile hoping that it would stun itself against the face glass and fall into the bottom of the suit where it would be comparatively harmless, but no such luck! There was nothing I could do, so eventually I gave the " up " signal and went up to have my face glass removed. The wasp flew out at once so I was saved the nuisance of undressing completely, but it settled on my attendant's hand and stung him.

We learned to regard the shot rope as home base, rather like the " diamond " in baseball, and the stray rope as a link with home. If a diver were to go wandering off without a stray rope he would soon lose all sense of direction because there are very few recognisable landmarks down below. Of course, a diver on the loose cannot get very far because he is always limited by the length of his breast rope and air hose, but if he were doing a search job down below and lost his stray rope—easily done if you happen to trip or stumble—he would have to signal " up " in order to start all over again to locate the object he was looking for.

My first solo dip was quite an event. I was as lonely down there as Robinson Crusoe before the advent of Man Friday. The sense of isolation was terrific, unbelievable. I was cut off from the world, except for lifeline and air hose, in complete silence but for the impersonal noise of the air as it entered the helmet and the hiss of the outlet valve. No human voice could reach me. We learned to dive without telephones, partly because they were in those days in-

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Checking equipment before a descent.

efficient and unreliable, but mainly because it was essential that we should become thoroughly familiar with the rope signals.

In fact, signals are made both on the lifeline and the air hose. One pull on the lifeline from diver to attendant means that the diver is all right: it is also commonly used as a signal of acknowledgment. One pull on the air hose means that less air is required. Two pulls on the lifeline means " send me a slate ", but on the air hose they mean " more air ". Three pulls on the lifeline mean " send me a rope ", but on the air hose they mean " take up slack in rope and air hose ". Four pulls on the lifeline mean " I am coming up ", but on the air hose they indicate the extra urgency of " haul me up!"

When the diver is working on wrecks, air hose and lifeline are often joined together for security and then a different set of signals is put into operation. Bell signals are also sent on both air hose and lifeline. Non-naval readers, and possibly some naval ones, may wonder how " bell " signals can be sent. I expect most of you have heard a ship's bell signalling the time of day. The ship's bell is rung with its own special rhythm which is practically the same as that of a telephone bell—two rings followed by a pause. Precisely the same rhythm is followed in diving signals of the " bell " type. The signal itself is still a tug on the lifeline or air hose but the use of a different rhythm converts two pulls into one " bell ". There are also special signals for special kinds of work. Indeed, we all found that there was much more to be learnt about signals than we had imagined. The system was a little Morse code in itself.

Diver and attendant are rather like two partners in a thought-reading act. The signals may have to be interpreted to some extent according to the existing conditions. All signals received must be acknowledged. Four pulls on the air hose is an emergency signal not to be used unless something really serious has happened. Naturally there should be no delay in responding to such a signal. Curiously enough in my diving career I have found that on the occasions when I really needed to send an emergency signal I could not do so, either because my lines were snagged or broken, or because it would have been just as dangerous to ask to be hauled up as not to ask.

That first solo dip really was a highlight in solitude —oppressive, macabre solitude. Beyond my face glass there was no sign of life, nowhere was there any sound of movement, traffic, wind, lap of waves, or anything else except hissing air. Beneath my leaden soles was softish mud, unpleasant to walk on because one never really felt quite secure on it, around me water as thick as soup pressing against me, always pressing against me with a hint of menace that made me realize that life itself might depend on the efficiency or correct adjustment of the valves in my helmet. It was an eerie experience, creating an indelible impression of the temerity of man in committing himself to so different a world. And yet it was thrilling, exciting, and challenging. In a way I enjoyed it.

Years later, when listening to the late Tommy Handley's " Itma " programmes on the radio, I often wondered what induced him, or Ted Kavanagh, to use the diver character with his mournful " Don't forget the diver!" I suspected that someone connected with the " Itma " programme had once experienced the solitude of a solo dip. I once put down the late Will Hay while he was making the film, " Windbag the Sailor ". Diving played no part in the film. Will Hay wanted to go down just for the experience.

The instructors soon passed me out of the walking-about stage and gave me various jobs to do under water. A large tank (with a large hole, by the way), was thrown overboard at random in about 10 fathoms of water. I had to find the tank by " quartering " the area in ever diminishing half circles. This was not difficult. Then I had to make a sketch of the hole as my hands remembered it, so that a patch could be made to cover it, fit the patch by drilling holes in the tank and bolting the patch on. All this had to be done laboriously by hand: we had no pneumatic or electric drills. Finally I had to fit valves in the tank so that compressed air could be blown in through one valve while the growing air pressure blew the water in the tank out through the other valve, thus making it possible to float the tank to the surface. Then my work was inspected in the critical daylight above and its value was assessed by the instructors.

I was given all kinds of jobs to do under water, such as joining two metal pipes together, joining drain-pipes with nut-and-bolt joints, the trickiest part of which was to get the pilot bolt into position, building walls with bricks, or heavier versions by laying bags of concrete.

There was even an old wreck down there which was used for tuition purposes. I had to get into it through various narrow openings, being careful not to tear my suit, make my way through its tilted passages keeping my lines clear of snags. I had to examine the propellers and report on their condition and what metal they were made of, examine the hull of the wreck and the shape of the various holes in it. On this wreck I saw my first conger.

I had to re-learn the weight and power of tools when used under water, and there is quite a difference. At the bottom of the sea constant exaggeration of force is necessary in the use of tools.

One could drop marks for losing tools or leaving them behind. A diver rarely forgets his tools because in any case he never takes down with him any but the most elementary tools; he hasn't the carrying capacity. If he requires a particular tool he simply sends a slate message to the topside men and they tie the tool to a shackle and it comes sliding down the breast rope almost at once. He is, however, often liable to lose a tool or to lay it aside and forget it. Laying aside a tool in the wrong kind of place may indeed result in the loss of it. Soft mud will soon absorb a heavy hammer, for instance. One has to learn too that wooden objects " sink " upwards when released, and so fast that a diver cannot hope to recover anything made of wood once it has slipped out of his grasp.

As soon as we had grown accustomed to shallow diving, we were gradually taken deeper and deeper until we reached the maximum depth possible in the Hamoaze. At a point near where the *Impregnable* lay there was a depth of 22 fathoms at high water. In order to make certain of achieving this depth we went out in the diving boat just before high tide. We did not do any jobs of work at this depth, we merely walked about and acclimatised ourselves. We also learned how to come up by stages, stopping to do physical exercises at each stage so as to decompress ourselves properly.

Diving at great depths causes a certain amount of special physical discomfort, in some cases one might almost say distress. Two more pupils retired at this stage. They found that they could not stand the pressure. The remainder of us continued practice dives at depth until we thought nothing of plummeting down 130 feet in a minute and a half. To pass the time under water we used to go fishing. Near Millbrook there was a deepish pool in the river where the old cruiser *Powerful* lay and underneath her we could always find skate. I " found " my first skate by treading on it. For crabs and lobsters we searched among the wooden piles of jetties and we caught some monsters of each variety. My wife and I were living locally at Keyham at the time and the fish I caught down below during this period helped our slender budget quite a lot. Anybody who came to supper in those days could usually be sure of some delicious lobster.

While doing a practice dive at 22 fathoms in the Hamoaze River, I had rather a nasty experience. Walking around on the muddy bottom in nil visibility I fell into a deep pit. The bottom of this hole was between two and three fathoms lower than the average depth of 22 fathoms at that point. In the fall I lost my stray rope and at the same time experienced a severe squeeze.

I found myself sitting on the bottom of the hole with my back against a rock, completely lost without my stray rope, and without any sense of direction. I wondered whether or not I should give the up signal, but on consideration I thought that the giving of the emergency signal might reflect on my marking and at that late stage of my training I did not want to do anything that would prejudice my chance of passing, so I crawled around the hole on my hands and knees until I found a way out. Even after I had reached level " ground " I still did not know where I was, did not have the faintest idea in which direction the shot rope lay, but I continued crawling about until I found it.

At the end of the course we were given a final practical and theoretical examination. Later a typed notice was drawing-pinned up on the notice board, with my name at the top of the list. Next came the name Claude Williams, with the letters V.G. after it. Now I was really pleased that I had not given the emergency signal when I had fallen into that hole: I feel sure that it would have reduced my marking.

So at long last we had realised our ambitions; we were now qualified mechanic divers, and our basic rate of pay went up automatically by 6*d.* a day.

Chapter 10

THE CASEMENT STORY

WHILE we were waiting at Devonport for assignment to a ship, big events were shaping in Ireland, and someone else's line of destiny was veering towards mine. This particular line, unimportant enough at its start, began at Sandycove, near Dublin, in the year 1864. It ended in the Tower of London in 1916. This line crossed mine in 1916 at a point on the map which seemed to indicate at first sight that the Ruler of Lines had made a mistake, because at that point then there was nothing but 25 fathoms of water.

But there was no mistake! In 25 fathoms off Queenstown, Ireland, in an indigo world of startling beauty where fishes turned and twisted among the gently waving weeds, an act of mine influenced the life of Roger David Casement; perhaps it would be more correct to say the death of Roger David Casement.

What can one say of Casement, one of the most extraordinary traitors in history? Was he fool, knave, or hero, or a compound of all three? And what is the real truth about the infamous Black Diaries?

Casement's father was a Protestant Irishman from County Antrim, but the family was Irish by adoption only, having come originally from the Isle of Man. This makes it all the more difficult to understand Casement's treachery, because there was no historical bias behind him; he had no deep roots in Irish history. Even the fact that he was born in southern Ireland was purely by chance.

He spent most of his early life in Antrim and was educated at Ballymena, a small town north of Belfast. After he left school he eventually set off for Liverpool, where he obtained a clerical job with a shipping firm. A year later he went to West Africa, and subsequently to other parts of the world; he was a great traveller. On his first journey abroad he was assistant purser in an Elder-Dempster ship. He was a darkly handsome young man of considerable charm of manner and a silver tongue in ordinary conversation, though his performances on the public platform in later life were less convincing.

After various travels in West and Central Africa, Casement obtained an appointment in the Consular Service of Great Britain. He seems to have been an efficient consular and customs officer. Casement's official reports from the Congo exposed the Congo atrocities, and the Foreign Office were so impressed that they made his reports the basis of an official protest to Belgium. The Congo scandals made a great noise in the Edwardian world. Casement's name was front-page news and he became the hub of a worldwide campaign to stop the Congo atrocities. He was given a decoration for his work: later he was to be knighted.

About this time he seems to have developed a grudge against the Foreign Office, but in view of later history, one of his official reports at this period is most interesting. In it he roundly condemned a certain Major McBride for attempting, on behalf of the Boers, to form an Irish Brigade from the thousand odd Irish prisoners-of-war that the Boers had captured. This report constitutes reasonably clear evidence that at this period of his life Casement had no Sinn Fein sympathies.

After leaving Lourenço Marques, Casement returned to London, visited Ireland, and was eventually appointed to the position of British Consul at Santos, Brazil. In some of his journeys into the interior he found that exploitation of the natives was going on there, too, and in the course of many reports to the Foreign Office he exposed this scandal. Casement had, in fact, found a gimmick with which to obtain publicity, and he worked it to death. He was less successful with his Brazilian exposés but nevertheless his reports attracted some attention.

By this time it seems that Casement's character had deteriorated. His moral turpitude seems to have equalled, even excelled, that of his contemporary, Oscar Wilde. The chief difference between Wilde and Casement was that Casement did not get found out—at least not until after his arrest on a charge of treason, when his papers were examined by the police and the Black Diaries came to light. Indeed, it seems to have been something of a toss-up in the legal circles in charge of his prosecution whether to indict him only for indecency, in which case a conviction would have meant that his name and reputation would be forever smeared in Ireland, or whether to try him for treason only, in the probability that a conviction on this charge would make him another Irish martyr.

Casement had become in heart and mind an Irish separatist. He was worked on and flattered by Irish sympathisers in London, who fed his tremendous ego by treating him as a much bigger man than he really was.

Although he was publicly loyal to Britain, his private correspondence with Irish friends and sympathisers was full of treasonable matter. Indeed, it seems almost incredible that the Foreign Office could not have known something about Casement's inclinations. Whether or not the Foreign Office suspected that Casement was sliding into treason, he was still drawing salary as a British official and had accepted British honours, including a knighthood.

After his retirement from the British consular service, Casement became more and more involved with Sinn Fein. He went to America where he teamed up with the Irish sympathisers, and where he eventually wrote an Open Letter to the American Press (which letter was subsequently reprinted in Ireland). This overt act forced the Foreign Office to take official notice of his activities. They wrote to him. It was a letter which gave him a last opportunity to consider what he was doing. Casement did not reply.

Casement now threw himself openly into Sinn Fein activities, but one cannot help feeling that his private behaviour made him a liability to the movement. Some time after the outbreak of the 1914 war, he went to Germany, travelling under an assumed name, but openly enough with a painted Norwegian male he had picked up in America, whom he called his "Norwegian girl". In Germany he tried to induce Irish prisoners-of-war to be false to their allegiance—the very brand of treachery he himself had condemned at the turn of the century.

Except for a few malcontents, the Irish prisoners would have nothing to do with Casement. This project having failed, the Germans did not know what to do with their curious guest. Eventually they decided to get rid of him. They could not spare any troops for service in Ireland, but they were quite prepared to send arms and ammunition to assist an Irish rebellion. The arms and ammunition were sent in a ship named the *Aud*, which flew the Norwegian flag. Casement was packed off to Ireland in a German submarine, which landed him near Tralee. At the Irish end the whole conspiracy seems to have been shockingly bungled. There was no one to meet Casement on his arrival and he was picked up by the police immediately.

Equally there was no answering signal to the lights flashed by the *Aud* when she made her first landfall, so she stood out to sea to wait for the next night to try again.

Meanwhile the British authorities had not been idle. They had deciphered the German secret code and they had a good idea of what was afoot. A sloop (*Bluebell*) was ordered to sea to look for the *Aud*, but had it not been for the *Aud's* failure to make contact the first time of trying, the British plan of interception would have failed and the arms would have been landed. As things actually turned out, the sloop sighted the *Aud* on the following day and signalled her to heave to. The *Aud* continued to run, whereupon the sloop fired a shot across her bows.

Now the arms and ammunition in the hold of the *Aud* had been thinly camouflaged by a top layer of trading goods, ostensibly sent from Norway to Ireland, but her German captain knew that search by a British sloop's crew would soon expose what lay beneath the camouflage. He dare not risk any more shots because one lucky hit might blow the whole ship to smithereens, and he did not want to surrender, so he scuttled his ship. Before she went down, her captain hauled down the Norwegian flag and defiantly ran up German flags. She went down in 25 fathoms off Queenstown—a difficult but not an impossible depth for diving.

Chapter 11

IN A STRANGE INDIGO WORLD

WHAT the soldier said is not evidence, and what the Admiralty suspected about the *Aud* compared with what they could offer as proof in a trial before a jury were two very different things. The Admiralty wanted to know, if it were humanly possible to find out, exactly what the safe and the holds of the *Aud* contained, and they wanted to know in a hurry because even trials for treason cannot be put off indefinitely. One hundred and fifty feet below the turbulent surface of the Irish Sea lay evidence that was, or might be, needed to complete the case against Sir Roger Casement, who was in the Tower of London awaiting trial. It might, of course, turn out that this particular evidence would be superfluous, but in a court case one never knows: the only safe rule is to have everything and everybody marshalled and available.

Naturally the Admiralty were also interested in the cargo of the *Aud* from other angles. If she carried weapons as they suspected, then the naval technicians would be interested to examine them to see if they contained anything new, and to find out on what lines German technicians were working.

Meanwhile at Devonport, Williams and I, and three other " graduates " were waiting for ships. We did not have to wait long. The first vacancy for a mechanic diver was in the battle-cruiser *Indefatigable.* So, as I was the first on the list, that was my ship. Well, perhaps I might have done worse, I thought. *Indefatigable* was a Pompey ship and Portsmouth is not quite so far away from Falmouth as Scapa Flow.

Less than an hour after I had been warned for *Indefatigable* I was summoned again to the office of the gunnery captain. An urgent signal had come through from the Admiralty. Two divers were required for special work, one to be experienced, and the other to be a good young man.

Brooking, the experienced diver who had been selected, and I were interviewed, sworn to secrecy, and given some preliminary briefing about the nature of the work. It sounded interesting. I returned to the barrack-room to pack.

" Off so soon?" queried Claude. " I didn't think you'd be going for a day or so yet. They usually take some time to get your papers fixed up in the office."

" I'm not for *Indefatigable,*" I explained. " Brooking and I are going to Ireland on a hush-hush job. Can't tell you any more about it: we've just been sworn to secrecy. Not that we know very much about it, anyway. We do not know that we shall have to dive deep—pretty near the limit."

" Why Brooking?" asked Claude. " He hasn't even bothered to keep himself up-to-date."

That was true enough. Brooking had originally qualified years ago and had come to Devonport for his periodical refresher course as required by Admiralty regulations. He was contemptuous of what he called all this new-fangled stuff. Catch him doing physical exercises on the way up!

" That's what the signal said," I explained. " One experienced diver, one young diver."

" I suppose this means that I shall go to *Indefatigable*," observed Williams.

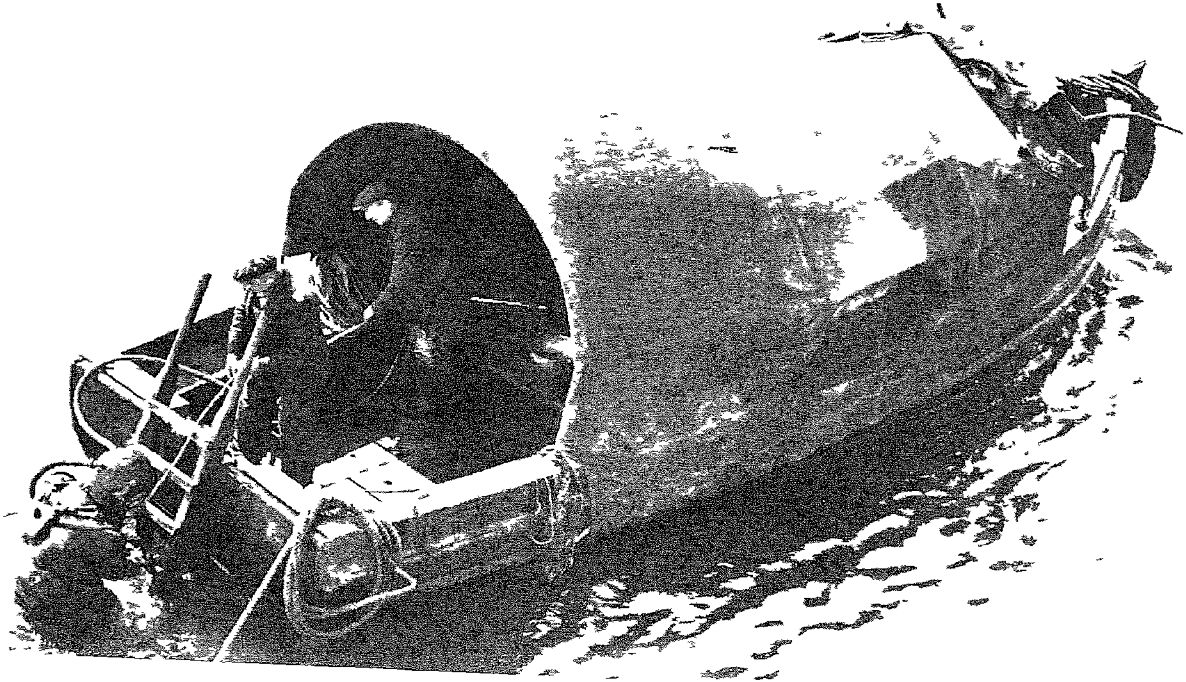
" I should say it's a hundred to one you will," I replied. " You're next on the list and unless they come along with another urgent signal within the next ten minutes or so you'll be warned for *Indefatigable*."

" Well, that's a bit of luck for me," enthused Williams. " After you've finished with this special job of yours you'll probably end up in some scruffy little destroyer in Scapa Flow."

As to the second part of his forecast he was almost right, but in the first part he was wrong; the luck was all on my side.

Saying good-bye to Claude Williams was quite a wrench. These youthful man-to-man friendships can sometimes be very powerful ties.

Brooking and I sailed from Fishguard on the s.s. *Inniscarry*. It was the roughest sea trip I had made to date and the *Inniscarry* was the smelliest ship I was ever aboard, then or since. How she stank! Her usual cargo consisted of pigs, cattle, and geese. She was, in fact, known as the " Pig Boat ". Decades of



Operating in the navigation channel

HARRIS

carrying these odoriferous creatures had impregnated her timbers from stem to stern with an overpowering stench from which there was no escape. The smell was so foul that Brooking and I remained on the wave-swept deck, risking a ducking in preference to taking shelter below.

The gale had one redeeming feature. The U-boat campaign against our shipping was in full swing and the Irish Channel was a favourite hunting ground for German submarines. There is little doubt that our progress was watched by at least one periscope but the sea was so rough that it would have been almost impossible for a submarine to attack us.

When we docked at Queenstown we reported to the gunnery officer under Admiral Bailey. We received further briefing about the job in prospect. We found lodgings in Queenstown with a Mrs. Morrissey. From there we went to the scene of the scuttling daily by launch. Three Irish civilian divers named Scott, Murphy and Dempsey from the Holboline Dockyard had already started work on the *Aud*. Dempsey had blown open the captain's safe, brought up the documents it contained, and had taken them to London where he was remaining in case he might be required to give evidence of finding.

Jock Scott was too old for such deep diving and he retired from the job soon after our arrival. In those days 33 fathoms was pretty near the record for deep diving and it was not considered feasible for a man in a rubber suit to be able to do any useful work at that depth. This was why the *Lusitania* was considered out of bounds for divers. At 25 fathoms the experts considered that useful work could be done in limited spells provided proper precautions were taken. But even under the most favourable conditions, 25 fathoms is a lot of water to work in. Jock Scott found that he could not stand the strain.

Brooking was the next casualty. He had learnt his diving technique before the Haldane experiments on the effects of deep diving and he sneered at the new rules made by the Admiralty to prevent caisson disease. He was always far too anxious to get back to the surface, possibly because he, too, felt the strain of deep diving more than he cared to admit. He was always too impatient to perform physical exercises at various stages of the ascent. His attitude was a very common one among the older divers of that day. He worked on the rule of thumb theory that if deep water caused him distress then the quickest way to get rid of the distress was to get back to the surface as soon as possible.

Brooking came up even more quickly than usual after one dip: in fact he took only two minutes to ascend from 150 feet—a crazy, almost suicidal thing to do. There was no recompression chamber anywhere near Queenstown. When he came up from this dip, I took off his face glass, and saw at once from the grey pallor of his face that he was far from well.

" I don't feel too good," he said in answer to my questioning look. " Pains in the elbows and stomach."

" You'll have to go down again," I said. " You've got an attack of The Bends."

" Not bloody likely!" he declared. " Give me a tot of brandy and I'll be all right."

Pains in the joints are not uncommon after a deep dive, but stomach pains are a serious symptom. Caisson disease or The Bends is a complaint that frequently attacks deep divers. In fact before Professor Haldane discovered the cause of this complaint and worked out a method of prevention, caisson disease was a real terror for divers, often causing permanent disability and even death.

At a depth of 25 fathoms the pressure is about 66 lbs. to the square inch and, of course, the diver has to maintain a slightly higher pressure in his suit to resist the squeeze of the sea. Pressure has various curious effects on liquids. As far as a deep-sea diver is concerned, the important effect of extra pressure is that it enables his blood to absorb more air. Perhaps "enables" is too feeble a word; "forces" would be better. The oxygen component of this extra air is used up by his system but the inert nitrogen component remains "in solution" and when the pressure is removed, the nitrogen escapes from his blood in the form of bubbles. It is rather like removing the crown cap from a bottle of fizzy lemonade, or the cork from a bottle of champagne—the gas imprisoned in the liquid under pressure bubbles out as the pressure is removed. Of course, human blood is a much thicker liquid than lemonade or champagne and it does not bubble so easily. The process is therefore less spectacular and there is always likely to be a delayed action effect. In many cases no bubbling may occur until some time after the diver has reached the surface. The effects may also be in certain cases cumulative. A diver who is diving daily in deep water may not have got rid of all the previous days' bubbles before he goes down again and acquires a fresh charge. Thus, over a period of regular diving, his blood may acquire a little more nitrogen every day without producing anything more in the way of symptoms than vague pains in the joints which may be ascribed to rheumatism.

Bubbles in the bloodstream can be extremely dangerous if they form in the main blood vessels around the heart, especially in the case of an older man whose coronary vessels are already a little choked with deposits of cholesterol, and particularly so in the case of an elderly man who is getting a little stout—like Brooking. At best they impede the circulation of the blood in various parts of the body, usually selecting the main joints, causing more or less severe pain which makes the sufferer double himself up (hence The Bends). Bubbles that reach the heart may cause a condition similar to coronary thrombosis—agonising pain in the left arm, palpitation of the heart, and tightness of the chest, all accompanied by fear of impending death.

Professor Haldane's decompression tables, which have been adopted as standard by the Admiralty, take care of the possibility of an attack of caisson disease. I can offer myself as living proof of that, because in thirty years of following the tables religiously I have never had an attack of this complaint and I have never been in a recompression chamber.

Even after only 20 minutes spent on the bottom of the sea at a depth of 150 feet, stops of two, four, eight, nine and twelve minutes are necessary at various stages of the ascent, giving a total stopping time of 38 minutes, nearly twice as long as the duration of the dive itself. After two hours on the bottom at 150 feet, a diver should take three hours to come up. Our normal daily diving spell on the *Aud* was 2½ hours and the correct ascent time was about 3½ hours, so you can imagine the risk that Brooking took in coming up in two minutes.

Just why he had not fallen a victim earlier is difficult to explain. I can only think that his blood was thicker than normal, did not bubble easily, and the symptoms did not occur until he was supercharged by cumulative effect. Then the attack came on with great suddenness while he was still down below, in fact while he was ascending, and the onset of the attack made him do the worst thing possible, i.e. hasten his ascent.

Brooking would not go down again; nothing would induce him to do so, neither friendly persuasion nor a direct order from the gunnery officer in charge of the operations. We gave him some brandy, which bucked him up a little but did nothing to relieve his pain. As soon as possible we took him ashore to hospital. We had to help him at every stage of the journey because the attack was so sharp that he was partially paralysed. We explained the position to the doctor in charge.

" Why bring him here ?" asked the doctor, bluntly. " You know as well as I do that there's only one cure for him—to go down again and to come up slowly. Put him down again."

" I won't go down again," said Brooking, obstinately.

" Well in that case I'm sorry but there's nothing I can do," replied the doctor. " Take him home. I can't waste a valuable hospital bed on a man who can cure himself but won't."

In the end, however, we prevailed on the doctor to admit Brooking to the hospital, where, even if nothing positive could be done, at least a watch could be kept over his symptoms and general condition. He remained in bed from the Thursday of the occurrence and was still in bed when I went to see him on the Saturday afternoon. He was still in great pain.

" I hear," I said, making conversation, " that the old *Inniscarry* was sunk by a German submarine on her return voyage."

" About time that stinking old tub had a good wash," replied Brooking.

" I'm doing a private job tomorrow," I went on. " There's a tug stuck out there with about a mile of wire round her propeller. They want me to get it untangled."

" Nice bit of overtime for you," said Brooking. " How much are they paying you ?"

" Don't know yet," I replied. " Depends on how long the job takes."

" Well, I expect you can make it last as long as you want it to," grimaced Brooking.

" Still in pain?" I asked.

" Hellish!" he nodded.

" Why not come along with me tomorrow?" I suggested. " You're doing no good here. You'll have to go down again eventually otherwise you may end up crippled for life."

" How deep is the water where this tug is anchored?" asked Brooking.

" Thirteen fathoms," I told him. " Not really deep enough for your job, but it might work the trick especially as you've been decompressing yourself the hard way for three days. I could put you down for an hour and then you could see how you felt."

Eventually Brooking agreed to go down. I think it was the severe pain he was suffering rather than my friendly persuasion that induced him.

So on the following day I took Brooking out to the tug and put him down in 13 fathoms for an hour, bringing him up slowly by easy stages, taking 90 minutes over the whole ascent. Before I could remove his face glass I could see that Brooking was smiling. As soon as he set foot in the diving boat he started doing a fantastic clog dance in his heavy diving boots.

" Not an ache or pain anywhere," he rejoiced. " What a treat to be shot of all that nagging."

Brooking was cured, but he never dived again. A week later caisson disease claimed another victim. This time it was Murphy, also an oldish man. We put him down again and got rid of the worst of the symptoms. Murphy retired from the *Aud* job. Whether he retired altogether I do not know. In spite of his age he would have been perfectly all right for shallow diving.

These two cases were object lessons that I never forgot. They were clear warnings of the dangers that threatened divers on the Casement job; we were all in line for caisson disease if we neglected the precautions laid down for our protection. Mind you, there were many divers like Brooking and it really was enough to try the patience of Job to have to hang about on the shot rope for 3½ hours after completing a 2½-hour spell of duty at 150 feet down. It all seemed so puerile—doing physical exercises under water just to get rid of a few bubbles. There were often physical considerations too that demanded more or less urgent attention. There are no public conveniences for the diver in Davy Jones's locker.

The Germans were apparently well aware that salvage work was in progress on the *Aud*. On several occasions we found that the five buoys used to mark the position of the wreck had disappeared during the night. Of course, it might not have been the Germans who were responsible for this. We were in a busy traffic lane and it was always a possibility that a passing ship might cut our buoy ropes, but we found it hard to believe that passing traffic would disturb all five buoys, not once, but on several occasions. We were pretty sure that it was the Boche at work, but it was certainly surprising that he was content with such half-hearted, almost childish, measures. Although the diving operations were well protected by naval vessels, we were always wide open to attack by torpedo.

The trick of removing the buoys achieved nothing except some slight delay, because we could always find the wreck again from the shore marks we had taken, plus a little dragging in the vicinity. Actually the Germans would probably have done much better, at little risk to themselves, by dropping a few depth-charges on the *Aud*. With the explosives she carried in her holds, one direct hit would have blown her to smithereens.

Frankly we were more than a little nervous about the contents of the holds. Speed was so essential on the Casement job that we did not even stop to look for booby-traps, which meant taking considerable risks, because the Germans are great hands at this. In France at that time scarcely any German retreat was so hurried that they could not spare the time to prepare a few unpleasant surprises. A favourite trick was to leave a dead Boche lying in an evacuated trench, and underneath him an egg-bomb or a stick-bomb, which would explode as soon as he was picked up. Many a British and French soldier stretched out his hand to pick up an attractive-looking brand-new Lüger pistol only to discover too late that it was attached to a wire that exploded a bomb.

There was not even sufficient time available to unload the *Aud* the safe way, item by item, each object being handled with the respect and care due to explosives. There were detonators aboard that ship containing fulminate of mercury, a powder that is so sensitive that it can sometimes be exploded by stroking it with a feather. A preliminary examination of the *Aud* showed that she was lying on her side. The diver's job was to go right into her hold, fix a large grapnel in position, and then stand clear while the tug above dragged on the wire hawser attached to the grapnel.

At fair grounds and amusement arcades you have probably seen the gaming machine called the Rotary Merchandiser, in which the player tries to pick up articles by manœuvring a miniature grapnel. This kind of game was played on a large scale and in deadly earnest in the black holds of the *Aud.* There were prizes every time, dozens of them. As the tug strained on the hawser, the large packing cases came tumbling out on to the ocean floor. It was dangerous to handle explosive cargo so roughly. Maybe some above-the-water strategist at the Admiralty had the idea that explosives are safe under water. Not so! Indeed, a sovereign for every stick of gelignite I have personally exploded under water would buy me quite an expensive motor car. Fortunately there were no accidents, but as we examined our prizes day by day our qualms increased.

The most interesting exhibit was packed in a case about 8 feet high by 6 feet square. Inside was a metal cylinder, six feet by three, fitted with numerous dials and gadgets. Its mechanism was obviously very intricate. As an artificer diver versed to some extent in engineering, I was able to appreciate that it was a masterpiece of its kind. With German thoroughness the gadget was supplied with its own special tools, which were neatly packed in a hold-all inside the case. Actually it was a big infernal machine or time bomb, probably the largest thing of its kind ever made up till then. It was evidently intended for the demolition of some famous building—possibly the Law Courts in Dublin—as a signal for the start of the Irish Rebellion. In any crowded area its explosion would have caused terrible loss of life.

There were ordinary bombs, Russian rifles and ammunition, and all kinds of minor armaments of war. The successful landing of 20,000 rifles, even captured Russian rifles of somewhat obsolete pattern, might have made all the difference to the Irish Rebellion.

I said there were no untoward incidents, but I did have one slight accident on the Casement job. On one occasion I did not stand quite clear enough as the packing cases came tumbling out, and a case landed on my foot and held me fast. I was trapped for about ninety minutes before I succeeded in freeing myself. This was one of the occasions when I dared not use the emergency signal.

From an artistic point of view diving on the *Aud* was a wonderful experience. The deep blue colour of the water made the underwater scene weirdly beautiful. Under water everything appears to be slightly magnified. It was a distinct change for me to be diving in such perfect surroundings after the dingy dips in the Hamoaze at Devonport. Now I was really enjoying my work. The sea bottom was clean and firm, mostly sand and small shingle. Outside the ship there was ample light, although in the holds of the vessel it was, naturally, quite dark. However, darkness meant nothing to me as I was by this time well accustomed to working by touch.

The light down below, blue though it was, was so good that it tended to make one forget the great depth at which we were working. Sometimes I would go about my job too vigorously. On such occasions a sudden feeling of deadly tiredness would warn me that before long I might be overcome. These spells were probably caused by an excess of carbonic acid gas. Immediate rest was imperative to ward off the threatened lapse into unconsciousness. A diver cannot lie down because the air in his suit would then go to his feet and probably turn him upside down. The next best thing is to kneel down, and this I used to do, yawning wide and often to get my lungs washed out with fresh air, or at least air as fresh as I could get it. In addition I used to press my nose against the face glass, blowing vigorously to clear my head.

After sufficient evidence had been obtained to suit the Admiralty, my services were retained for some time in obtaining souvenirs of the *Aud* for the notabilities of the day. The German ensign at the stern of the vessel went, I believe, to Buckingham Palace; the white flag with the black cross and double German eagle in the centre went to the Imperial War Museum. There was a particular demand for the Russian rifles, specimens of which were brought up for Lloyd George, Asquith, Jellicoe, and Beatty.

Orders were given that no more than 12 souvenir rifles were to be salvaged. I had already brought up more than this number. I rather wanted one as a souvenir myself, but I could see no way of getting it ashore. It so happened, however, that the Master-at-Arms also wanted a Russian rifle as a souvenir: so did the other divers. The Master-at-Arms was in a better position to make arrangements to get them ashore than we were, so once having agreed to go into this " unlawful " venture all together, we left everything to him. In fact, he wrapped the guns in waterproof coverings, and lashed them underneath the keel of the shore launch. At night we unloaded the contraband rifles and smuggled them ashore in our hammocks.

After leaving Queenstown, we had to report to Devonport, where it was certain that we should at once be given leave of absence. On the train to Devonport we gave much thought on how to avoid the double trouble of smuggling the rifles into Devonport Barracks and out again.

Finally we took the guard of the train into our confidence. He was sympathetic and he arranged that the parcels should be left in charge of a porter at Keyham, the station before Devonport. Then we could pick up our trophies there as we came on leave.

And that is how an obsolete Russian rifle, sent by Germany to assist the Irish Rebellion at the instance of Sir Roger Casement, comes to be hanging in the entrance hall of my home at Falmouth.

In addition I picked up some small souvenirs—German tools, such as a screwdriver and a pair of pliers, thoughtfully supplied by the Boche to enable the necessary operations to be done on the gadgets in the *Aud.* I still have these small tools, and they are still in use for various small household jobs. Very good tools they are, too!

Just before we left Queenstown, there came the news of the Battle of Jutland, in which the battle-cruiser *Indefatigable* was sunk with heavy loss of life. I found out very shortly afterwards that Claude Williams had gone down with her. The ordinary people of Queenstown were shocked by this disaster. I could never understand how the Irish Rebellion came to be staged judging from the political attitude of the people I came into contact with in Ireland. I can't say that I ever met a rebel or a Sinn Feiner!

Chapter 12

NINE FEET OF CONGER

I HAVE had some interesting experiences with fish under water, and some of them took place while I was diving on the *Aud*.

There have been some nasty moments with big fish but on the whole I have had more fun than frights during my thirty years of deep-sea diving. Of the many fish I have met down below I dislike conger eels the most of all. They are particularly fond of secreting themselves in the waste pipes of sunken ships and I was startled on several occasions during my early dives by the sudden appearance of a conger at the mouth of a pipe. I soon learned to tap all pipes in the vicinity of my work before settling down to a job.

Many people will not eat the conger because they believe that this eel eats human flesh, but I suppose this is at least a possibility with most fish and crustaceans. It is perfectly true that congers tend to hang about wrecks, but you are just as likely to find them in the wreck of a Spanish galleon as in a very recent one. Equally so they frequent rock formations which provide crannies in which they can hide. On the whole, therefore, I incline to the belief that congers favour wrecks because of the excellent hidey-holes they provide. As far as my own personal observation goes, I have never seen conger eels eating anything but other fish.

The biggest conger I ever saw was one that surprised me while I was diving on the *Aud.* It is generally true to say that the deeper the water the bigger the fish, but there are exceptions to every rule. The largest fish I ever met, a basking shark, caught me in quite shallow water.

However, I was not thinking about fish as I found a footing on the firm sand beside the *Aud.* I should explain that as she sank the vessel had started to turn turtle, but apparently she had started this movement too late in her downward plunge to be able to complete it in the depth available. Her mainmast had hit the sea bed and had snapped off. This must have checked the turning movement of the ship. It may even have caused a certain amount of rebound. At any rate the *Aud* settled down on her side and there was no mast in her mast-sheath, merely a gaping hole.

As I approached the ship I noticed something moving about in the mast-sheath and there came gliding out of the hole a huge conger. I have already mentioned that under water everything is slightly magnified. Allowing for this effect I estimate that this conger was about eight feet long and as thick as my thigh. Attracted, possibly, by the bubbles rising from the outlet valve of my helmet, the big fish swam slowly towards me. I decided to remain where I was.

It was not an easy decision to make but I figured that if I started to go up the conger might decided to try a tentative bite to see what I was made of. Slowly, so as not to annoy or excite the conger by any sudden movement, I unsheathed my diver's knife, which was as sharp as a razor. Then realizing that my bare hands were particularly vulnerable, and possibly capable of carrying a scent to the conger, I put them behind my back.

The conger approached me in leisurely fashion, and reared itself up on its tail like a cobra about to strike. Now I could estimate the length of the brute. I am six feet tall and with three feet of its tail horizontal the conger's head was on a level with my face glass. I have discovered since that congers grow even bigger than this—up to ten feet in length and one hundred pounds in weight. But the *Aud's* lodger was quite large enough for me. I could see that he would be a tough customer to handle in an underwater fight.

I took a firmer grip on my knife and waited tensely. With the conger's horrid head only a foot away from the glass of my helmet, I stared for what seemed to be an age into its ophidian eyes. I would not care to assert that the human eye has any power over fish as it sometimes seems to have over animals, but instinct warned me not to blink or shift my gaze during this queer staring match. Occasionally the conger opened its mouth and I could see a set of pointed teeth capable of slashing my suit to ribbons if a rough-and-tumble ensued. At that great depth I should not have stood a chance with a punctured suit.

Eventually to my intense relief I succeeded in outstaring the conger. The brute lowered its head and swam slowly away into the blue haze. Not until that moment did I realize that I had been holding my breath.

"Phew!" I exclaimed. "I hope there aren't any more like him about."

Since then I have seen many congers while at work on wrecks and have even tried to catch them, but it is practically impossible to catch a conger under water. They swim quite slowly and it is not too difficult to get a hand to one—a smallish one, of course—but grasping them with the hand is useless. They seem to possess a muscular contraction system which, combined with the slippery slime that coats their bodies, enables them to wriggle through the tightest human grip with the greatest of ease. The only way to get a conger, under water, is to wait beside a pipe you have tapped. Then as soon as the conger pokes its head out to see what all the disturbance is about, you stab him in the back of the neck with your diver's knife.

Crabs are fairly easy to catch. A small net dropped over the selected specimen is sufficient to render it helpless. Another method is to turn the crab on its back and twist a lanyard about its claws. Lobsters are full of fight and full of tricks, and they give the impression that they possess intelligence of a sort. You cannot get behind a lobster: it will always face the enemy, its claws poised for action. A lobster will watch the diver with its stalky eyes and allow him to approach within a certain distance. Then with a powerful flick of its tail it will jump backwards a yard or so and await further developments. A lobster is prepared to play this game indefinitely, making no attempt to get right away, but the diver, although his patience in pursuit of a tasty supper may be endless, is limited by the length of his lifeline. The lobster seems to know just when you have reached the end of your tether.

I soon learned that it was useless to chase lobsters in open country. To catch one it is essential to drive him into a corner. In reverse gear the lobster can move like lightning but its forward gait is just a clumsy shuffle. Even when the creature has been cornered it is still no easy matter to catch it. You have to slip your hand behind waving pincers that can move fast and that possess sufficient strength to amputate a finger. People may tell you that a lobster is quite harmless once you have grasped its body. Don't believe it! I have known a lobster to press its " elbows " into its sides in a last desperate attempt to trap my fingers.

A large lobster earned me a severe reprimand at the diving school. It was a recognised thing that we could do all the fishing we wanted to do under water during practice dives; indeed it was a good way of passing the time under water. On this particular occasion I had gone down prepared for lobster fishing and almost as soon as I landed on the bottom I saw a very large lobster. This one, I thought, I must catch; he was a beauty.

I followed the usual procedure. As I advanced, the lobster retreated, but never very far. Finally I managed to corner him against the sea wall, dropped a noose around his body and pulled the slip-knot tight. Then, without taking any further precautions, I tied the line to my belt and signalled up, being careful to keep my hands out of reach of his claws. On the way up I felt that my legs and feet were getting wet, and wondered what was happening. As soon as my face glass was removed I told my attendant to take the lobster from my belt. He did so, at the same time discovering that the creature had taken such a grip on my diving suit with his claws that they had punctured the rubber, making a hole about an inch long.

For this misdemeanour I had to go up before the gunnery captain, who reprimanded me severely for permitting my diving suit to get torn.

Skate and rays can be caught quite easily by a diver. The difficult part of the problem is the initial step of finding the fish. These species rely on protective colouring and immobility, not only to escape attention, but also in order to catch their food. To a deep-sea diver a skate is worse than a banana skin to a pedestrian. Often enough I have slipped on an unseen skate with the result that my feet have shot out from under me, and I have seen the same thing happen to other divers, chuckling to myself because the sight of a diver's legs going upwards in a slow motion version of a fall is certainly funny. At the same time I stood by to render assistance, if necessary. Once down, a diver does not always find it easy to regain his feet.

The skate's favourite food is a lobster that has just cast its shell. The skate lies in wait on the sea bed waiting for a soft shell to pass that way. When a victim approaches, the skate lifts one wing and the white underside seems to attract the lobster. It crawls underneath the wing to its doom.

Having located your skate, the best way to catch it is by using a barbed spear with a line attached to the other end. By itself the spear is not much good because the skate is a living suction cup and is able to cling to the sea floor with surprising tenacity. If you tried to lift the skate with the spear, the barbs would simply pull through the flesh. That would give some idea of the power of the suction, because the body of a skate, uncooked, is pretty leathery. Having planted the spear, with your free hand you scrape away the mud or sand under one wing of the skate to break the suction. Then you twist the free end of the line round the barbs of the spear where they project through the fish, and he is yours. Why not do the whole job with bare hands? Well, skate run pretty large and they are quite powerful. It is a hard job to hold a sizeable skate under water with the hands alone; ten to one it would get away.

By the way of experiment I have on several occasions taken a fishing line down with me, baited the hook, and fished from the bottom of the sea with the special advantage of being able to see everything that happened to my bait. Strangely enough I have never caught anything but crabs. Fish are extraordinarily cautious in approaching a still bait, although many of them will snap on chance at a bright, moving object. They inspect the motionless bait from all angles. Although I have attracted many fish with a piece of bait, not one has ever taken it. Possibly my air bubbles made them cautious, or perhaps they knew about angler-fish.

Speaking of air bubbles, their effect on a shoal of mackerel or pollack is curious. A diver always knows when a shoal of fish is passing overhead by the sudden diminution of light, comparable with the passing of a cloud over the face of the sun. The effect is rather eerie in the blue depths of the sea where the light is subdued at the best of times. As the shoal approaches the stream of air bubbles, it splits to avoid them, half the shoal bearing left and the other half bearing right. Some distance on the shoal comes together again, leaving a diamond-shaped wedge of "sky" around the bubbles. Although small fish seem to avoid bubbles I have some reason to believe that they are a source of attraction to large ones.

It is a matter of surprise to me that sea anglers are able to catch fish with worms. From my underwater observations fish never seem to feed on anything but other fish. Presumably the smallest fish feed on plankton or other microscopic forms of life, but as soon as they are large enough to swallow other fish they rapidly wean themselves to a cannibal diet. Occasionally I have seen fish nibbling at weed, but not often enough to be able to say that " vegetables " form a regular part of the diet of a fish.

While working at Scapa Flow, I witnessed the unusual sight of an angler-fish at work. This hideous brute, nearly all head and the head nearly all mouth, was half submerged in the soft bottom. A " fishing rod " projected from the top of its head. This ended in a fleshy lure, not unlike a worm (so apparently human anglers seem to have the right basic idea) and the angler-fish was able to move this excrescence as though it were a separate live entity. When a fish inspects the bait, the angler-fish gradually withdraws it until the pseudo worm is just over its wide open mouth. The fish smells the bait all round and eventually places itself right inside the angler's mouth. One quick snap terminates the proceedings. The angler-fish's mouth is lined top and bottom with seven rows of sharp teeth all slanting towards its throat. These teeth spell one-way traffic only. In Scotland the angler-fish is called " wide-gab ". It's a perfect name. As far as the worm controversy is concerned I do not know that the angler-fish's use of a lure proves anything, since I have never seen a fish actually bite at the lure.

The diving bird known as the shag or cormorant is a fine underwater fisherman, using both its wings and feet as fins. The feet, which are webbed, fold into small compass during the forward stroke but open out to the full extent of the web during the driving stroke. This little bird is the most agile thing I have ever seen under water. I suppose it has to be; it has to be faster than the fish on which it preys otherwise it would go hungry, but it is rather remarkable that a creature from another element should be more agile than fish in their own element. If there are any fish about, a shag rarely returns to the surface without having caught something. They tell me that an adult shag will eat 7 lbs. of fish in a day, so no wonder the authorities have put a price on the head of this bird. Cormorants fish in fresh water, too, and a pair of these birds in a lake can soon reduce its fish population. I have seen shag diving as deep as fifty feet but I understand that they can reach twice this depth.

One job I had in Falmouth Bay yielded a lot of fish, although the method used was not in the strict Waltonian tradition. I was breaking up some German submarines, which were lying close inshore, by exploding charges of gelignite under water. My employer at this time was a salvage contractor who rarely came near the scene of operations but pursued his own devices in and about the town of Falmouth. Soon after I had started work on the German submarines he complained to me that he could not hear any explosions. Now breaking up a wreck by explosives can be done in two ways. You can make your charges small and selective, breaking off just what you want broken off at that particular time and no more, or you can make them large and destructive, scattering pieces of metal over the sea floor for hundreds of yards around. I preferred the selective method as likely to yield a better tonnage of metal in the least possible time.

"All right," I said. "I'll give you an explosion that you'll be able to hear even if you've gone to Truro for the day."

I set a large charge of "jelly" and touched it off. Immediately afterwards the surface of the sea was covered with hundredweights of fish floating belly upwards, some dead, others stunned. We filled the boat with them.

My employer heard that explosion all right and he also heard about it—officially. It seems that a largish piece of German submarine flew into the air and dropped in the Castle gardens some 330 feet up the cliff at the base of which the subs. lay. That was the end of the heavy-handed method of breaking up the German submarines.

Some time later I tried the gelignite method of fishing again, with a much smaller charge, of course. I had taken out my boat to do some surface fishing to oblige a friend. I selected a spot near the wreck of the *Leo Martin,* a tanker which had gone down in Falmouth Bay after hitting a mine in World War II. It was usually a good spot for fishing but on this occasion there was absolutely nothing doing.

"I don't believe there are any fish here at all," observed my friend, after we had been fishing for a couple of hours without so much as a nibble.

"I expect we can soon find out," I replied, rummaging about in my locker. I had some gelignite aboard and I found an old tin into which I packed some of the explosive. Then I fixed up a greased fuse, passed it through a hole in the lid of the tin, lit it, and threw the thing overboard. Then we rowed like mad to a safe distance about 100 yards away. A few seconds later up went the charge and up came dozens of fish, large and small, their bellies showing white on the surface of the water. And down swooped the gulls, hundreds of them, screaming and fighting. Where they came from I can't imagine! A moment before you would have said that there were not more than a dozen gulls in sight. We rowed as fast as possible back to the scene of the explosion but by the time we arrived there the gulls had gobbled up all the smaller fish and the large ones, which were only slightly stunned, recovered as soon as our hands touched them and were off like a flash. We did not obtain a single fish, which probably served us right for using so unsporting a method.

We did pick up one object, however. It was a brand new sailor's peaked cap, but unfortunately it did not fit either of us.

" I must take a look at the *Leo Martin*," I said. " It looks as though her salvage possibilities are not yet exhausted."

It was, perhaps, only a matter of simple poetic justice that after treating the poor fish in this manner, I should myself be blown up with a charge of gelignite. This was probably the narrowest escape I ever had under water.

When using only light charges of gelignite under water I did not bother to come to the surface while they were being exploded. Instead, I would walk away from the scene of operations until I had reached a safe distance and then signal to my topside men to press the plunger of the electrical contact.

On this particular occasion I had set the charge and was walking away when I tripped over some wreckage and as I fell I jerked my lifeline accidentally. My attendant thought I had given the signal to fire the charge and promptly pressed the plunger. The charge went up only thirty feet away from where I was trying to scramble to my feet. I did not need to scramble any longer. The explosion lifted me bodily and blew me to the surface, where I arrived feeling very dazed and shaken. It really was a miracle that the buffeting I had taken down below did not damage my suit or helmet in any way, otherwise I should have been in real difficulty.

My last fishing story, in this chapter at all events, goes back to the Casement job. Just before my first dive on the *Aud* the topside men besieged me with requests for fish.

" There must be plenty of good fish down at that depth," they surmised. " Send us up some for supper."

I kept my eyes open down below but I did not see any fish worth catching on that occasion, so I got on with my work, which was to open up a hold that had not previously been examined. Judge my surprise when I found that in this particular hold the arms and ammunition had been camouflaged with a layer of galvanized buckets and tins of herrings in tomato sauce. Is there any deader fish than a herring in tomato sauce?

I could not get on with my job until this layer of camouflage had been cleared out, so I signalled for a rope to be sent down. As far as the topside men were concerned, that probably meant fish, because otherwise I should probably have asked for the grapnel. They got their fish all right, but they were probably the most surprised sailors in the seven seas when they found on the end of the line a dozen tins of herrings neatly packed in a nice new galvanized bucket.

Chapter 13

COLD BATH

AT the conclusion of the Casement job I was given 21 days leave, a very welcome break after so onerous a task, plenty of time in which to get decompressed. When my leave expired I was ordered to stand by at Pembroke Dock in South Wales to wait for the commissioning of a new ship. After our recent losses at Jutland we certainly needed new ships.

My future home turned out to be the *Cambrian*—a light cruiser. She commissioned under Captain Fountaine on 20 July, 1916, carried out her steam trials on 29 July and her power trials on 8 August. On 17 August she left Pembroke Dock and arrived at Scapa on the following day to join the 4th Light Cruiser Squadron under Commodore Le Mesurier. So that was the final answer to all my concern about trying to get posted reasonably near home. I was back again at Scapa, practically in the land of the midnight sun, as far away from Falmouth as I possibly could be, home-based: indeed I was nearer to Stavanger in Norway than I was to Cornwall.

For the rest of that month I wore ear-plugs because *Cambrian* was at sea doing her firing trials and target practice. Then early in December 1916 we went on patrol. *Cambrian* turned out to be a water-hog. In rough weather she tended to push her nose through the waves rather than to try and ride them and everybody on deck needed to keep a weather eye open for possible water whenever she dipped her bows. Our first casualty occurred during our initial days at sea. First-Class Boy Patrick Tiger was washed overboard.

Our patrols were usually of quite short duration. For instance, we left Scapa on 15 December 1916 and returned on 19 December. Our usual route was north out of Scapa, past the Shetlands, around Iceland up to the entrance to the White Sea, then back down to the Skaggerak and across to Scapa. Sometimes we did convoy work, shepherding as many as 90 ships in a single conglomeration.

There was not a lot of diving work for me to do. Being a new ship, *Cambrian* was clean below her water-line and practically nothing went wrong that called for the services of a diver; perhaps a waste pipe stopped up, or a Kingston valve not working. Of course there was the usual monthly practice dip. It is an Admiralty rule that at least once a month, oftener if possible, all divers, whether attached to sea-going or depot ships, shall don the Dress and take some exercise under water, each man being given a definite task to do, even if it is merely looking for something quite valueless that has been deliberately thrown overboard for the diver to find—just as dog owners throw sticks for their pets to fetch. Again, once a quarter, a practice dip has to be made in not less than 12 fathoms using a 2-cylinder pump. Not only do divers need regular practice, the topside men need it, too, perhaps even more so than the divers.

There was one awkward little job I had to do on the *Cambrian.* She had broken a piece off one of her propeller blades with the result that she was proceeding, even at half-speed, with an uneven thumpety-thump that threatened to do real damage to her shaft or engines. The ship was stopped while I went down to have a look. I worked for several hours on the broken blade, chipping, sawing, smoothing and rounding it so that the broken edge would offer less resistance to the water. When I came up the ship travelled on at half-speed. There was still some bumping but it was much reduced and was not now of a character likely to cause nervous prostration in the chief engineer.

However, the *Cambrian* did provide me with at least one memorable dive. After I had completed it I never had any further desire to take a cold bath. At about 3 p.m. on an afternoon in February 1917, Captain Le Fountaine sent for me. I guessed what was in the wind; indeed the whole ship knew that the captain had lost a torpedo, and that the loss of that *particular torpedo at this particular moment might* put him in a very awkward position.

Looking for lost torpedoes is a fairly common chore for naval divers. The torpedo is an important weapon in modern warfare, and even in time of peace the Royal Navy engages in regular torpedo practice. For practice purposes the torpedo is fitted with a dummy head and it is aimed, not at a target, but between two targets.

Occasionally the propulsive mechanism of a torpedo goes wrong. Sometimes it sinks as soon as it is discharged; sometimes it disappears during the course of a run; and sometimes it breaks surface in the proper manner at the end of its run, only to disappear before the recovery boat can reach it. Exceptionally the rudder-vanes may get bent during a broadside discharge and the torpedo will then take a circular course. In fact a torpedo has been known to circle back and hit the ship that fired it. Fortunately this boomerang incident happened during practice with a dummy head.

Torpedoes are set to run a certain distance, which may be anything up to five miles. When they have completed their scheduled run they should break surface and indicate their position by means of a calcium-phosphide flare which ignites itself automatically. Whenever a torpedo fails to bob up and show its flare, there is work for a diver. Torpedoes are too expensive to be left lying on the bottom of the sea.

Captain Le Fountaine was a great man for running torpedoes. He ran them on every possible occasion and on some impossible ones, too. On this particular day in February 1917 *Cambrian* was lying inside the boom defence. She was due to sail at first light on the morrow, with *Calliope*, to take part in the Fleet tactical exercises. Special orders might have come through at any time advancing our sailing hour. The captain had received orders to have his ship ready to sail by 12 noon on that day, and she was ready—until the captain decided to while away the afternoon by running a few practice torpedoes.

Every man aboard knew that this was very naughty of him, because a ship is not ready to sail while she has a boat lowered: much less so if, in addition, she has her diver on the sea floor looking for a lost torpedo. As bad luck would have it, the last torpedo that Captain Le Fountaine fired, failed to surface. A ship's captain is in a position of great authority but nevertheless he, too, is subject to discipline and he cannot lose a torpedo just like that. Whenever a torpedo is lost a full report of the circumstances has to be made and before any torpedo can be written off as lost, searches by a diver have to take place, and the diver has to make written reports about the result of those searches. The captain had, in fact, rendered himself liable to a court-martial on a fairly serious charge.

With these thoughts passing through my mind, I presented myself at the captain's cabin.

" Chard," he said. " I've lost a torpedo."

" Yes, sir," I acknowledged.

" The damned thing never showed again after it was fired," he went on.

" What was the setting, sir?" I asked.

" One mile," he replied.

I pursed my lips and whistled soundlessly.

" I know, Chard," agreed the captain. " It might be anywhere."

" It might even be beyond the mile," I suggested.

" What depth of water have we under us?"

" Twenty-two fathoms!" was his answer.

Again I pursed my lips, as I thought over the pros and cons.

" What do you say, Chard?" he went on. " Will you try to recover it?"

" What does the doctor say?" I asked cautiously.

" He won't sanction a dip," replied the captain. " He says that the temperature of the water is too low to send a man down."

" What is the temperature of the water, sir?" I inquired.

" I don't know," answered the captain. " I didn't ask him, but at a guess I should say about minus 2 degrees Centigrade."

" But that's below freezing-point!" I exclaimed, aghast. I knew of course that it was a pretty cold day, and indeed that it had been very cold for a long time. Skating was in progress all over England and Scotland and there had been no thaw for at least a month.

" There's one thing about it, sir," I grinned suddenly. " It will be a degree or two warmer than that at 22 fathoms and there won't be any of this confounded east wind down there."

" Then you'll dive!" he exclaimed.

" I shall have to think about that, sir," I replied. " If there was only myself to consider I wouldn't mind taking a dip, cold though it is, but as a married man I have others to consider. Suppose anything went wrong! Wouldn't the Admiralty be inclined to say that I had dived entirely on my own responsibility and wouldn't they therefore disclaim any liability to my dependants?"

"They might," agreed the captain rather glumly. Obviously this was an aspect of the matter he had not even considered. I turned the problem over in my mind while the captain waited anxiously.

"I think there's only one thing to do, sir," I suggested. "You'll have to order me to dive."

"You know as well as I do, Chard," he replied, "that I can't order you to dive in the circumstances."

"That's so, sir," I agreed, "but as I see things—and now I'm speaking simply as man to man and not as rating to captain—you may have to face a court-martial anyway. If you order me to dive and anything goes wrong, that would be one more count against you, but would one more count make any real difference to the position. From what I've seen of courts-martial, the prosecution are never happy with only one charge. They always manage to dream up at least half-a-dozen charges. And the only way I can see to protect my family and their position is to receive an order to dive from you."

"You're not much of a sea lawyer after all, Chard," smiled the captain. "Don't you see that if you accept an invalid order, knowing it to be invalid, then we get back to the *status quo ante*, that you would be diving on your own responsibility."

I debated the point in my mind. It was decent of the captain to mention it. He was probably right, and, after all, I might not be there to give evidence.

"You may be right, sir," I acknowledged, "but all the same I fancy the Admiralty would think it best to stand by such an order. If they took the opposite point-of-view, they would surely be throwing wide open the door for any seaman Tom, Dick, or Harry to refuse to accept an order because he thought it was invalid. I don't think that ratings can be expected to know whether orders are invalid or not; they have to rely on their officers not to give them invalid orders. However, it's a risk I'll take. You give me the order, sir, and I'll dive."

"Very well, Chard," said the captain. "I order you to dive to try and recover that torpedo."

In those days not much was known about the effects of exposure to, and immersion in, very cold water. Trench foot was already a familiar phrase, but scarcely anybody had heard of its close relatives, immersion foot and immersion hand. It was not until the Second World War, when so many ships were lost on the Murmansk run in the aid-to-Russia convoys, that scientists began to study the effects of immersion in very cold water on the human system. In 1946 Professor Molnar studied the records of the Bureau of Medicine and Surgery, U.S. Navy, dealing with rescues at sea between 1942 and 1945. He concluded that at temperatures below 40 degrees Fahrenheit (4·40 degrees Centigrade) the survival of human beings was a matter of minutes, not hours. Out of 40 men who had been immersed for up to 60 minutes in a sea with a temperature of minus 1·1 degrees Centigrade, nine men died on the rescue vessel. I think that if these facts had been known in 1917, neither the captain nor I would have even considered the question of diving to recover that lost torpedo.

However, the diving boat was lowered. I put on two sets of underwear and got into the Dress. At 4 p.m. I went overside and slid down the shot rope to the bottom at 22 fathoms. It was already nearly dark down there and it was obvious that before very long I should have no sense of direction at all. Normally one of the first essentials of search diving is to make sure of direction under water. A sense of direction is not enough because it fails miserably down below. Fishes seem to have an unerring sense of direction but I have never yet met a diver who knew with certainty which way was North and which South after he had been turned round a few times while descending his shot rope. Turns on the shot rope can occur without the diver being aware of them. If he should make a complete half-turn, he will start off in the opposite direction to that required, unless he first checks his position by physical means. There is no sun, moon, or star to give him a clue, no wind against which he can place a wet finger. He has a surplus of wet fingers but the wind is conspicuously absent.

Nevertheless, although it was obvious that I should soon be diving in complete darkness, I went through the motions of taking my bearings. First of all I found the anchor of the diving boat, where it lay on the bottom, and observed the angle of the anchor rope. Before descending I had taken note of the set of the tide and also of the state of the tide. I took down with me a length of rope, one end of which had been frayed out into fine fibres until it looked like a feather duster. With this tell-tale, a diver checks the set of the tide when he is down below. The set of the tide is, indeed, his only sure guide to direction. During a long dive, he will, of course, also want to know the time at which the tide will turn.

Having looked after these academic points, I walked out to the length of my stray rope and began to search, plodding and sometimes crawling around in gradually decreasing half circles. There was no time to follow the normal practice of getting myself hauled up and re-dropped every time a fresh searching centre was required. Instead I asked the boat above to up-anchor and then I proceeded to the next centre " towing " the boat behind me. This is rather a delicate operation because the movement of the boat, if excessive, might give the diver a very uncomfortable time: indeed, it might rupture his air-hose. The Admiralty frowns on this practice but it is a short-cut that is very commonly adopted in search diving. In such towing operations the diver has to be sure of his direction and my tell-tale was in constant use. After it grew too dark to see the tell-tale, I used my hands to feel which way the frayed fibres were flowing. At intervals of about two hours I had myself hauled up for a short breather, and also to check my bearings with those of the men in the boat, and finally to get my hands chafed. The cold was so intense that after a short spell below there was little feeling left in my fingers.

For nearly eight hours I plodded around in that freezing darkness. Finally, somewhere around midnight, my booted foot was arrested in its cautious forward shuffle by something solid. It had happened before, so I was not unduly optimistic. I bent down to examine the object with my numbed hands. It was certainly a torpedo, and it was probably ours, although that could not be finally ascertained until it had been hauled up to the surface.

Very carefully I traced the shape of it to ascertain which way it was lying. Even this simple determination took a long time because there was so little feeling left in my fingers that they were 99 per cent inefficient at determining anything by touch. My great fear was that in the darkness, with my hands so insensible, I might accidentally touch the trigger or compressed air lever, so setting the propulsive machinery in motion, and sending the torpedo off on another run.

From the gradual waisting of the metal I eventually discovered that my hands were near the tail of the torpedo and therefore already past the trigger. I sighed with relief and after some further fumbling I managed to fix a clamp on the propeller. Next I noosed a rope around its tail. There was, of course, a lifting ring screwed into the nose of the torpedo, but I rejected that as a base for knotting my rope because there was a million to one chance that the gyration of the torpedo as it was pulled up might, if the rope were tied to the ring, serve to unscrew it, and at this stage of the quest I was not taking even a million to one chance. With the rope made fast, I signalled for the torpedo to be taken up.

Then I went up myself, but I had to go much more slowly, and it was getting on for 2 a.m. before my helmet broke the surface, which was now covered with a thin film of ice. Yes, it was as cold as that, and for ice to form on the mobile surface of the sea it has to be really arctic.

The captain was overjoyed at the recovery of the torpedo.

" I'll never forget this, Chard," he promised.

To his credit, he did remember the service I had performed and when next the ratings were given seven days leave, my pass was made out for 14 days.

At dawn the boom opened and the *Cambrian* slipped out to take her place in the tactical exercises, but I was not on duty. I was still sleeping the sleep of utter exhaustion and almost 24 hours passed before I awoke—warm in my hammock, wonderfully warm.

It was not until nearly ten years later that I became aware of an unknown risk I had run. A diver in the London Docks was hauled up unconscious after a long dive in cold weather. It was discovered that moisture condensing in his air pipe had frozen into a solid plug which had cut off his supply of air.

At the time of the torpedo dive I had not even thought of that hazard.

Chapter 14

THE FOURTH BATTLE SQUADRON LOSES *VANGUARD*

ON July 9, 1917, the *Cambrian* was lying off Flota Island in Scapa Flow, not far away from the Fourth Battle Squadron, which consisted of *Temeraire, Collingwood*, *Bellerophon*, and *Vanguard.* It was past eleven o'clock and all deadlights had been down over the portholes for some time, although there were still some lights on. In the *Cambrian* except for the duty watches everybody was asleep or trying to get to sleep—not an easy matter on that very hot night, easily the hottest night of the year so far. I myself was asleep.

Suddenly I was awakened by the loudest explosion I had ever heard in all my life. I felt as though someone had let off a banger right inside my head. The force of the explosion blew the heavy deadlight up so that it crashed against the deck above and then crashed back again, narrowly missing my head, my hammock being slung alongside the inner skin of the ship. I suppose the porthole was uncovered for not more than a second while the deadlight was crashing up and then down again. While the porthole was uncovered I saw five more explosions and a second or so later I heard and felt them—stunning, wit-shaking concentrations of sound that, catching us half asleep or wholly asleep, left us dazed and bewildered. By this time there was a rattle of falling debris on the deck above us.

" General Quarters," sounded almost at once. At first we thought that the Zeppelins had caught the Fourth Battle Squadron napping, but after the rattle of debris had ceased, we could hear no sound of engines, and looking out of the portholes we could see no searchlights pencilling the sky. Then the buzz went round that the explosions were under water and we thought German submarines must have penetrated the defences of Scapa Flow. It was not too hard to believe this because earlier in the war Lord Jellicoe had regarded Scapa as an unsafe anchorage and had based the Fleet in Lough Swilly until such time as Scapa's defences could be improved. But this was not the occasion when U-boat Commander Prien succeeded in penetrating the defences of Scapa Flow. Another 22 years had to pass before that happened.

Half-dressed most of us, we rushed upon deck and started lowering the boats. Whatever was the cause of the explosions there would be survivors to be picked up.

" By God!" went up a shocked cry from the port side of the ship. " *Vanguard* has disappeared."

It seemed incredible that a great battleship, no matter how heavily attacked, could vanish off the face of the waters in a few seconds, but there was the stark fact: there was a gap in the line of battleships where yesterday *Vanguard* had floated at anchor.

Our boat was holed; most of *Cambrian's* boats had been holed by falling debris, but the damage was not serious. We plugged the hole and went on rowing. By this time the searchlights were on to assist us in our search for survivors. Few quests have been more hopeless. The first man we picked up from the floating debris was black with fuel oil. We got him aboard and tried artificial respiration, first easing his tongue forwards so that it would not drop back into his throat and choke him. At least we intended to ease his tongue forwards but imagine our surprise and horror when it came right out of his mouth, completely detached at the roots. We knew then that it was no use wasting any more time on him. If the shock waves of those explosions had torn his tongue away by the roots, he could not possibly have survived such a terrific concussion.

We spent about two hours in the boat looking for survivors. The surface of the sea was covered with two or three inches of fuel oil. We saw no one swimming, no one floating, we heard no cries for help, but we continued methodically to turn over pieces of wreckage in case there might be somebody underneath. We found only one more survivor. He was alive and kept muttering, "Help Stokes" before he relapsed into unconsciousness. He remained unconscious for eleven days. Eventually he recovered.

After about two hours we were recalled to *Cambrian.* Other boats from other ships continued to search until dawn. A boat from *Neptune* picked up Lt. Cdr. Allen C. H. Duke, swimming, clad only in his pyjamas, but he was so badly burnt that he died two days later without being able to recall any details of the disaster. A boat from *Bellerophon* picked up 1st-Class stoker F. W. Cox. He was conscious, swimming fairly strongly, and was not seriously injured. He told a story that sounded incredible, yet there he was to prove it. He had been reading in his hammock from about 10.15 p.m. at some unknown point of time thereafter he fell asleep, probably just before 11.20. It seemed to him that he was just dozing off when the lights went out, and that woke him up. Then there was an explosion somewhere below him. He was blown towards the deck above but did not hit it because it opened out into a great hole and the force of the explosion hurled him through the hole. He fell into the sea and a piece of deck fell on top of him, but he was still a foot or so under water at the moment of impact so he was not hurt by this. He swam from underneath the piece of decking and attempted, without success to save another man near him. The *Bellerophon's* whaler also picked up Private John Williams of the Royal Marines. He was suffering from shock, burns and bruises, but he survived the disaster.

Some of the officers and crew of the *Vanguard* were lucky. At the time of the explosion, three officers and 49 ratings were on leave, two sub-lieutenants had been lent to destroyers, and two midshipmen lent to submarines. Fifteen of the *Vanguard's* officers had gone to a concert given on board the *Royal Oak.*

At 11 p.m. the liberty boat left *Vanguard* to pick up the officers who were at the *Royal Oak* concert and to take them back to their own ship. The liberty boat had in fact visited the *Royal Oak,* picked up her passengers and had just started her return journey when the man at the tiller noticed a bright tongue of flame on board the *Vanguard* just abaft the foremast. In a matter of seconds it flared into a huge mass of fire and there was a heavy explosion. Pieces of wreckage began to fly through the air and the *Vanguard's* liberty boat wisely stopped rowing. One large piece of steel plating fell on the deck of *Bellerophon.* If this particular piece had fallen on a boat there would have been nothing left of the boat. A two-ton piece of wreckage dropped on Flota Island, two miles away. Other pieces of red-hot metal started bush fires on Flota Island. All the ships in the vicinity were damaged to some extent by the explosion. *Cambrian* escaped fairly lightly.

Nothing was allowed to be reported in the Press. Indeed, as far as I know, the story of the *Vanguard's* disappearance has never previously been told in print. The Admiralty were very concerned about this accident. There had been too many cases of ships going up as a result of " internal explosions ". On November 26, 1914, H.M.S. *Bulwark* was lying in the Medway. Her crew were drilling on deck and there was even a band playing, when up she went. There were only 14 survivors out of nearly 800 officers and men. The cause was supposed to be an internal magazine explosion. On May 27, 1915 the *Princess Irene*, a minelayer, went up at Sheerness while she was taking ammunition aboard. On December 31, 1915 the cruiser *Natal* blew up at anchor in Cromarty Firth, with terrible loss of life, including a number of women and children who were attending a children's party in the wardroom.

With this terrible list of " internal explosions " in retrospect no wonder the Admiralty investigated the loss of the *Vanguard* with great thoroughness. Rear-Admiral W. C. M. Nicholson of the First Battle Squadron presided over the inquiry. Fortunately Commander Wilfred Custance, gunnery officer of the *Vanguard* was available to give evidence. He had been a member of the party that had visited the *Royal Oak*. Gunnery officers from other ships were also called and questioned about the arrangements for safeguarding ammunition magazines, both in *Vanguard* and the Fleet generally. An Admiralty expert on explosives also gave evidence about the various types of ammunition that had been supplied to the *Vanguard*.

Nothing much emerged from all this technical evidence, but there was one piece of ordinary lay evidence that would have made startling headlines had the proceedings been reported in the newspapers. On the actual day of the explosion, July 9, 1917, two dockyard shipwrights had been working on board the *Vanguard*. They had been replacing the gear of a Holmstrom carrier in the gun-horse of " A " turret. This job would not take them anywhere near any of the ammunition magazines. They had left the ship just before 5 p.m. in an entirely normal manner. Both came to the inquiry to give evidence and during the course of their evidence it came out, quite casually, that one of them—a chargeman of naval fitters from Chatham Dockyard, had also been working on board the *Natal* on the very day that she went up.

You can imagine what the reporters would have done with this coincidence. Even the Admiralty was not too keen about dismissing the matter as mere chance. The chargeman was cross-examined in great detail, but he came out of it with a clear character. Indeed, the chief fact that emerged from his cross-examination was that he was remarkably ignorant about the details of ammunition magazines. But this was the kind of thing that might happen to any shipwright who had accidentally specialised on gun-turrets or some other kind of work and had not been required to go down into a magazine for some years.

Certain items discovered among the wreckage of the *Vanguard* led to a further investigation. There were some fragments of correspondence in German containing material that was highly suspicious, the photograph of a very fascinating young woman which was dated pre-war. The authorities were reasonably certain that the young woman was a German girl. A German bible was also found floating in the wreckage.

But in spite of a number of apparently suspicious circumstances, there was nothing that really gave any clue as to how the *Vanguard* went up, and "internal explosion" was again given as the verdict of the inquiry.

Within a week divers from all the ships in Scapa at that time were working on the spot where *Vanguard* went down, but down below there was nothing to indicate what had caused the explosions because there was no semblance of a ship left. The sea floor for acres around was littered with scarcely identifiable pieces of metal. Of course there were still some large sections of ship, but nothing that resembled a magazine. When we entered these large sections and searched them we found nothing but dead bodies, and worse still, pieces of dead bodies. This was easily the most gruesome of all my diving experiences —a horrific task that was to plague me with bad dreams for months afterwards.

Under water corpse faces are pallid and greenish, as well as slightly magnified, and the bodies float in odd attitudes. In enclosed spaces like cabins and mess decks a diver's bubbles seem to set up a slow circulation of the water so that quite frequently after you have turned your back on a corpse to do some immediately essential job like securing your mode of exit, you find on turning round again that it has floated nearer to you. This can be very disconcerting and a diver needs strong nerves to be able to stand this sort of thing. Sometimes, indeed, a corpse will creep up on you when you are busy and gently bump against you or touch you with a flaccid hand. It's almost enough to make a diver jump out of his dress.

I formed my own theory about what had happened to the *Vanguard*, i.e. that the explosions were caused by overheating of the ammunition magazines. As a shipwright who had worked on the interior fitting of battleships I knew just how important were the cooling trunks fitted at intervals in the magazines. These trunks were just large square boxes made of metal and containing nothing but air, but that air was circulated and kept cool by means of a series of electric fans fitted in the exterior walls of the magazines. The whole set-up was a simple example of air-cooling.

I think the loss of the *Bulwark* made the Admiralty check over its designs and plans for the cooling of magazines. I do know that *Collingwood* and *Temeraire* had a lengthy refit which included increasing the size of the cooling trunks in the magazines. Obviously there was something seriously wrong with the old cooling arrangements if spontaneous explosions could take place in the middle of winter, as in the cases of the *Bulwark* and the *Natal.*

Whether the *Vanguard* was refitted in this way I cannot say for certain, but it is highly probable that she was. In very hot weather it would obviously be necessary to keep all the fans going, sucking hot air out of the magazines and blowing in cool air to take its place—as fast as possible and as often as possible.

Time and again, however, in the *Cyclops* and also in the *Cambrian,* I had seen officers switch off these fans in order to save electric current. My guess is that on this very hot night some current miser among the officers had switched off one fan too many and that was the end of the *Vanguard* and her company—including Tug Wilson.

Chapter 15

UNEXPECTED DIVE

AFTER the *Vanguard* disaster, life proceeded quietly and regularly aboard the *Cambrian* for a time. We did our patrols almost with the regularity of a bus time-table. Sometimes we came back to Scapa, sometimes to Cromarty Firth, and sometimes into the Glasgow dockyard of Fairfields for refitting.

One of the most difficult jobs that fell to my lot aboard the *Cambrian* was up aloft,- not down below. While on a winter patrol we had run into very bad weather and suffered some minor damage. The copper spill at the top of the mast, which forms a solid base for the lightning conductor, had broken off, and it was necessary to drill out the broken piece, and fit a new spill.

I suppose I was selected for the job because I was the youngest mechanic aboard the *Cambrian.* At all events nobody else wanted to go aloft in that weather, with the top of the mast swaying in a wide arc over distances of thirty or forty feet every time the ship rolled. I did not feel too happy about undertaking the job myself, but the first lieutenant told me to do it, so up I went. About half-way up the ladder of the mast I lost my foothold and there I was swinging about in mid-air, hanging on with my hands like a monkey. Every time the ship rolled I could see the waves coming up to meet me at express speed. However, I regained my foothold and went on up to the top. The job itself was a fairly simple one, but the conditions under which it was performed were terrifying, especially as I had to use my hands to do the work and had only my knees left wherewith to grip the mast.

But the days we spent in Scapa Flow were not without their humour. Early in 1917 in the wardroom aboard the *Cambrian* there were the usual leg-pullers—the wags among the officers—whose day was never complete without setting a trap of some kind or another. Into this setting came one Lieutenant Hoskings, son of an admiral. With his background he should have known better, but he turned out to be a real sucker. Indeed, he had often talked himself into an embarrassing situation because of his constant boast that to him nothing was impossible. This included diving. He loved to feel that without taking any of the risks he was a party to the dangers down below.

And this was the way Lieutenant Hoskings walked slap bang into a diving trap—a dare by one of his fellow officers to " take a dive ".

It so happened that a fault had developed aboard the *Cambrian* while she was at sea. The trouble appeared to be in the propeller shaft or bracket and an investigation by a diver was pending.

" Chard is going down tomorrow. Why not take a dip with him?" suggested one of the officers to young Hoskings. Having boasted so long and loudly about his prowess at anything to which he cared to turn his hand, the young man could not very well back out, and the following day I was informed that Lieutenant Hoskings would be going down with me.

Before my face glass was screwed into place I gave the lieutenant last-minute instructions.

"I'll be sitting astride the propeller shaft and I'll haul you in alongside me as you come down," I told him. It was pretty deep where the *Cambrian* lay anchored and if he missed the pull-in the potential danger to a greenhorn was very great.

But I have every reason to suppose that these instructions of mine scarcely made any impression on his mind.

It was a beautiful day. As I sat on the propeller shaft in the shadow of the stern waiting for the lieutenant to make his entry, the strong sunlight lit up the area around me in a technicolour green. Never was there a better day for taking a first dip.

Then I saw the heavy boots of the lieutenant coming down very slowly. He looked for all the world like a puppet on a string. Holding on to the shaft bracket with one hand I stood on the shaft ready to pull the lieutenant on to the shaft in front of me. I grabbed his nearest leg to haul him in. I never saw anyone in a diving suit move so quickly under water. He kicked out violently with both feet, landing one hefty blow on my helmet that nearly knocked me off my perch.

He certainly knew the " up " signal. After his one violent outburst, he returned to the surface as fast as he could—and that was quite as fast as I could have returned. I, too, went up, and saw a group of grinning officers peering over the gunwale of the diving boat.

" What did you go up for?" I said to the white-faced Lieutenant Hoskings.

He found it difficult to reply.

" You devil, Chard," he burst out, when his vocal cords started working again.

He could not possibly have listened to my parting instructions for my touch on his leg to have startled him so. That was all there was to it. My touch had surprised the life out of him, although what else he could have expected I cannot imagine.

I leave you to imagine the amount of ribbing he had to endure in the ward-room after this incident.

The *Cambrian* was still a water-hog. On March 17, 1918 there is an entry in *Cambrian's* log book, " Lt. Cdr. Gray-Smith washed overboard ". The story behind this brief entry is that there was a heavy sea running and there was something wrong with the paravane gear. The lieutenant-commander and a leading seaman went forward to try and fix it. At one dip of the bow both men were washed overboard; at least there was no sign of either of them when the bow rose and cleared itself of water. Down went the bow again a fathom deep into another wave and when it came up we saw that the legs of a man were tangled up in the paravane wires. We rushed forward and rescued him, fortunately succeeding in getting him clear before the bow dipped again. It was the leading seaman, half drowned, but artificial respiration brought him round. Nothing more was seen of the lieutenant-commander.

On June 2, 1918 we were involved in a bit of action off the cost of Norway. We picked up our first sight of land at 5 a.m. and an hour afterwards we sighted a small ketch at two points on the port bow, then fifteen minutes later a sail dead ahead and at 7 a.m. a fleet of fishing smacks. At 8.30 a.m. we sighted a steamship and altered course so as to intercept her. The steamship also altered course and started to run back to the shelter of the fjord she had just left. We fired a blank shell and signalled her to stop, but she still ran for it and " General Quarters " was sounded in the *Cambrian*. As we chased the ship, which turned out to be the German *Gamma*, into the fjord, we saw that she had deliberately run herself aground. At 9 a.m. she was ordered to abandon ship and at 9.13 the *Cambrian* fired a torpedo which hit the bottom: at 9.35 a second torpedo was more successful, leaving the *Gamma* a total wreck. Out came a Norwegian destroyer to see what all the noise was about. No doubt her captain was justifiably annoyed at finding a foreign warship conducting operations within the three-mile limit of territorial waters. He signalled us to stop but we did not see the signal and at full speed ahead we left the fjord behind. The destroyer could not do very much about this, or maybe he did not want to . . . but I was no longer interested.

Somewhere in that Norwegian fjord somebody fired something at us. Personally I think it was a torpedo. It certainly did not hit *Cambrian* but it did hit something—possibly a projecting rock on the bottom pretty close to us (we were manœuvring in dangerously shallow water). At all events there was an explosion of some magnitude that caused the *Cambrian* to heel over. At that moment I was climbing the superstructure to visit the blacksmith's shop. The explosion shook me loose from my grip and I dived to the deck 15 feet below, landing on my left shoulder, and becoming the one and only casualty of the action. Falls are funny things. One man's neck can be broken by a fall of only six feet whereas another man may fall 80 feet or more and escape without serious injury. When I picked myself up after this dive, I felt sure from the severity of the pain that my shoulder was broken.

The ship's doctor, an ebullient Irishman, thought otherwise and he prescribed a belladonna plaster. I realised, naturally, that severity of pain is not necessarily a sure guide in diagnosis; toothache, for instance, can be extremely painful but it is rarely serious. However, there was a certain "feel" about my shoulder that indicated something more than bruising. Strange how difficult it is to describe pain apart from the stock varieties of burning, shooting, and pricking; it is often, indeed, quite difficult to determine exactly where the pain is located. The medical profession might do well to consider the idea of drawing up a complete list of types of pain. I am sure that the existence of such a list would help them greatly in diagnosis by helping many a tongue-tied patient to tell the doctor about his pain.

After nearly a month had gone by with no further treatment (the original plaster now frayed, grimy, gaping, and wrinkled, still stuck precariously to my shoulder) and no improvement in my condition, I began to take stock of things. Like most young men who have never suffered any serious pain, I liked to think that I was indifferent to physical discomfort. In the course of an exceptionally healthy life I suppose I had experienced rather less than the average ration of pain. Certainly at no time previously had my fortitude been seriously tested. Some of my previous pains might have been sharp but they had also been short, and my idea was that any pain could be met by setting the teeth and clenching the fists. I did not realise until then that there are varieties of pain so long-enduring and so excruciating that this schoolboy remedy of muscular tension cannot possibly be maintained against them.

This present pain was something quite outside my experience, quite different from anything I had previously experienced in the way of nerve protest. It was not a single pain but a number of separate items that seemed to shoot out radially from a focal point, which also seemed to throb—apparently in the same tempo as my pulse. At times I tried to count the number of radial pains but this proved to be impossible. They were irregular in interval and often one clashed with another. I could not even be sure that the pains always followed the same route.

Occasionally my preoccupation with the shoulder pains would be disturbed by a swift stabbing pain in the small of the back, an agonizing twitch that went almost before it had arrived. These literal stabs in the back made me gasp and I came to regard them as definitely unfair; unexpected attacks at a point where I had no defences mustered. Laughable in retrospect, but not a bit funny at the time!

I was soon forced to abandon my old remedy of gritting my teeth and clenching my fists. The effort took too much out of me and after a time it seemed to make the pain worse. Eventually after many suppressed groans, especially at night, I found that muscular relaxation was more efficient than tension. Relaxation enabled me to neutralise the mental effect of the pain with a minimum of effort. I found it possible to separate my attention into two distinct spheres, one of which was reasonably free to occupy itself with other matters while the other acted as pain sentry in the neighbourhood of the injury. But those unexpected stabs in the back always caught me off guard.

My only excuse for dwelling on this aspect of the matter is that the pain continued without any diminution for nearly a month. I was not getting better; I was getting worse, and eventually I had to take a step that needed a lot of prior consideration. The ship's doctor was busy with more serious cases and in time of war naval and military surgeons tend to take little notice of any " wound " that does not puncture the skin. Obviously the doctor had come to the conclusion that I was swinging the lead—which, taken in its literal sense, was certainly one of the naval jobs that I could never have performed. Or possibly he did not want to admit that his earlier diagnosis had been wrong.

Whatever the reason, his obstinacy put me in a very invidious position. Pain was my constant bedfellow and I was becoming increasingly convinced that if some other treatment were not soon given I might lose the use of my right arm for good. Eventually I put in a request to see the captain. This is a step not lightly to be undertaken by a man under discipline when his intention is, in effect, to criticise the efficiency, behaviour, or conduct of a superior officer. No doubt it is convenient to commission naval and military doctors, but the ratings and soldiers under their care would feel a lot happier if their doctors had civilian status.

"Well, Chard?" said the captain, when I appeared before him.

"I'm not satisfied with the medical treatment I'm getting, sir," I said. "I'm pretty sure this shoulder is broken and I would like to have it X-rayed."

"What treatment have you been getting?" asked the captain.

"One belladonna plaster, sir," I told him.

"It hasn't even been renewed?" he asked, raising his eyebrows slightly.

"No, sir! And I expect you know as well as I do that a belladonna plaster is not effective after 48 hours."

"And the plaster did not relieve you?"

"Not a scrap, sir; the pain is just as severe now when I move the shoulder as it was when the accident first happened. The only improvement arises from the fact that I have become very cautious about making any movements that involve the shoulder."

The captain thought for a few moments. I hoped that he was thinking along these lines—that my recovery of his lost torpedo had demonstrated that I was not the sort of man to make a fuss about nothing. But of course, one's expectations of what another man is thinking about you are usually far too high.

"Request granted, Chard," he said. "You'll go ashore at Invergordon to have your shoulder X-rayed. That's something that certainly ought to be done at this stage."

Invergordon Hospital did not keep me for very long. They did not X-ray me there but they were satisfied that my shoulder was in fact broken and that owing to the delay in setting it the job of getting it right again was likely to be a long one. Invergordon was mainly a receiving and distributing hospital; they had to keep as many beds as possible free for incoming casualties. So from Invergordon I was transferred to a hospital in Anlaby Road, Hull, where an X-ray picture established that my shoulder was in fact broken. I remained in the Hull hospital until 18 August, 1918, on which date I was invalided out of the Navy as unfit for further service in any capacity. Indeed, for a long time I feared that I would be incapable of doing any right-handed or two-handed work for the rest of my life, but after 18 months of idleness at home my almost useless shoulder and arm began to mend and the improvement was such that my pension was no longer justified, so after its time-lapse at the end of 18 months I did not ask for a further medical board. Instead, I began to think about what I could do to earn a living in Civvy Street.

Chapter 16

DON'T SIT ON MY AIRPIPE

SANDOVER, the salvage man, was still operating the *Mallard* in and around Falmouth. I went to see him, finding him with reasonable certainty in the bar of his favourite hotel. He conducted most of his business in the bars of pubs and hotels. Any longshoreman with information about a wreck could always rely on scrounging a pint or two from Sandover, and if the tip turned out to be really worth while, the man would receive a present of five pounds or so. Many of these leads actually led nowhere and I think the majority of them were invented for the sake of a free pint. The annual cost of Sandover's " sources of information " item must have been very high.

" Can you use another diver, Mr. Sandover?" I asked.

Sandover stroked his heavy black moustache; if you can remember that picture of Stalin in a peaked cap then you have a good idea of Sandover's appearance.

" Who are you?" he asked.

" Name of Chard," I replied. " I've been in the Navy."

" Search diver or artificer?" he asked.

" Artificer!" I replied. " I served my apprenticeship as a shipwright in Falmouth Dockyard before I joined the Navy."

" Right!" agreed Sandover. " I can use you. Let's have a drink while we discuss terms."

" No, thanks," I declined. " I don't drink."

" Well, that's a change," he laughed. " You'll be the cheapest diver I've ever employed."

Sandover paid me a weekly retainer and so much per hour when diving. The annual total of my earnings was considerably higher than I could have expected to earn as a plain shipwright, but I had to work pretty hard, averaging about 400 dips a year, i.e. a morning and an afternoon dip each of about four hours duration on most of the weather-suitable days in the year. This was nearly all shallow diving. It had to be; no diver could have stood the strain of so much deep diving.

The most important man aboard the *Mallard* was one-eyed Tom Gilbert, the engineer, a man of about 55, a native of Plymouth, his round ruddy face adorned with a square-cut greying beard and a moustache. Gilbert was a big man, an inch over six feet in height and about 15 stone in weight. He lived on board the *Mallard.* He knew all the wrecks and he could dive if the occasion demanded it, but his chief function was to keep the *Mallard's* engines turning and to be able to do that he had to be a good engineer. Practically every day produced its need for some improvisation or other. Apart from the fact that the engines were very old horizontal piston types, never highly efficient even when new, Sandover himself had further reduced their efficiency.

I believe that Sandover, that quaint character, would have salvaged his own grandmother for the sake of the stoppings in her teeth. He had removed the *Mallard's* bronze propeller and replaced it with an iron one—much heavier—that dragged on the engines. He had stripped out all her copper tubing and substituted iron piping, leaving steam leaks in many places. By the time he had finished salvaging the *Mallard* alive—so to speak—her rate of progress through the water had been reduced to two knots. This meant that in almost any adverse condition of wind, tide, or current, she was more likely to go astern than forward. The *Mallard* was in fact a standing joke along the waterfront at Falmouth.

Some of the members of the *Mallard's* crew were no less incredible than Sandover himself. One of them kept a huge spider with a body as big as a tangerine orange in the top of his locker as a pet. It must have been a foreign variety. I have never seen an English spider that came anywhere near it for size. He kept it, so he said, to diminish the fly nuisance. He also had a pet rat which came up for food from underneath the boards whenever he whistled it. I made it a condition that if ever I had to sleep on board the *Mallard* I would sleep only in the wheelhouse.

Being a family man with my own home in Falmouth, I did not live aboard the *Mallard* and as a result of her slow speed I did not get much home life. If we had any distance to go, it meant starting in the middle of the night and not getting back until about 24 hours later. With so little motive power to assist her, you can imagine the amount of finagling that was necessary to arrange the *Mallard's* voyages so that she would always be able to run with the tide, current, or wind. Sandover lost many valuable diving hours because of the inefficiency of this ancient gunboat. But that did not worry him. He rarely made a trip in her and so long as she was paying her way, he saw no reason to make any changes. Quite frequently I have slept in an open diving boat so as to be on hand for diving when the tide served because the *Mallard* could not possibly take us home for the night and get us back in time to catch the best diving tide.

During the immediate post-war period the *Mallard* must have been earning good profits for Sandover. My first job and my stock job for some time was that of picking up anchors and cables in Falmouth Harbour. During the war ships were often in a great hurry to get away to join a convoy and if they had any difficulty in getting up their anchors, they would slip them by knocking out the shackle-pin and letting the cable join the anchor on the sea bed. To replace an anchor and cable at new prices would have cost around £1,000, so naturally the captains concerned did not write off these slipped anchors as total losses. They all hoped to be able to recover anchor and cable one day. To this potential end, the captain either marked the spot with a buoy or took a number of bearings from landmarks.

Sandover had permission to pick up all the lost anchors he could find. The recovered anchors would then be handed to the Customs who would endeavour to trace the owners, Sandover then getting a fixed fee for recovering the anchor. Of course in some cases the owners could not be traced; possibly the vessels concerned had been subsequently sunk. In these instances the anchors and cables were sold and Sandover would receive the purchase price realized less the expenses incurred.

In my first twelve months with Sandover I must have picked up 30 anchors with cables up to 35 fathoms in length, each worth possibly £500 at current market price. Some of the anchors were easy to find; others were difficult. Frequently both anchor and cable would be deep in mud but a good length of cable will usually find at least one hard spot on the sea bed where it is visible to a diver, or where he can feel it. Then it is a simple matter to slip a wire under the exposed piece of cable, lift gradually with power from above until the cable is pulled clear of the mud, thus leading the diver to the anchor itself.

My dirtiest job was trying to find the anchor of the old French battleship *Implacable*. This old " wooden wall " had been used as a training ship. During the war it was decided to move her from her permanent mooring up into the River Fal so that she would be out of the way of shipping. It had not then been possible to raise her anchor, so it had been slipped and the spot buoyed. It ought to have been easy enough to find, but at that point in Carrack Road at the entrance to the River Fal there was a drop in the sea bed from 7 or 8 fathoms to 16 or 17 fathoms, quite a sudden drop over which poured the mud of the River Fal like a waterfall. In the course of centuries this had formed a pool of thinnish mud many fathoms deep, soft on top and soft all the way down.

The first time they put me down here I sank over eight feet deep in the mud without realising the fact that I was in mud. Certainly I thought the visibility was pretty bad even for the River Fal. It was not until I began to have some minor trouble with my outlet valve that I realised I was in mud. For over a week I dived in that filthy stuff, probing here there and everywhere, dragging crosswise in the hope of finding the anchor cable, but without success. In the end we had to abandon all idea of recovering the anchor and cable of the *Implacable.*

Yes, Sandover certainly had his losses as well as his profits, and some of the former amounted to quite a lot of money. Towards the end of the war a Dutch grain ship, the *Epsolon* struck a mine and went down in Falmouth Bay about 2½ miles off the St. Anthony Lighthouse. She was a single-funnelled steamer of about 7,500 tons. Her cargo was removed very shortly afterwards by means of a grab dredger and was sold to distilleries. In 1919 I started work on this wreck with the idea of salvaging her eight deck winches, each worth about £200. These winches were bolted to the deck each with ten 1¼ in. bolts, all well and truly rusted in. The movement of each holding-down nut had to be laboriously started with a cold chisel and a hammer, then continued in the normal way with a wrench. If the bolts started moving round with the nuts, then they had to be cut through with a hacksaw and knocked through like shackle-pins.

After a fortnight's really hard work on this job I had cleared the eight winches ready for lifting on the first fine day.

As a matter of fact towards the end of the day we had already started to lift one winch. I had fixed a wire sling to the loosened winch, and had knotted the sling to a heavy rope with what I thought was a perfect bowline knot. Then I signalled "Haul away". The winch certainly went up, but a few seconds later it came down with a thud about six feet away from where I was standing. It seemed that I must have tied a slippery hitch. Needless to say after that experience I brushed up on my knots and hitches. At that point we decided to leave the winch and call it a day as I did not feel like tempting Providence again straightaway.

The next day was fine, but Sandover decided to leave the *Epsolon* and visit the *Bay of Panama* instead. Probably one of his pub cronies had given him a hot tip about the full-rigged sailing ship *Bay of Panama* although it is difficult to conceive that there was anything fresh to learn about her. She had been down below for nearly forty years and had been inspected by numerous divers. So we spent a futile day at the *Bay of Panama* while about £1,600 worth of winches were waiting to be lifted off the *Epsolon*.

The next day the weather turned rough and it continued so for several days. During this period Trinity House decided that the *Epsolon* was a danger to shipping and that she must be blown down into rubble to leave sufficient depth of water for other ships to pass over her. No sooner said than done! When next we visited the *Epsolon* she was no longer there in the shape of a ship. We picked up some odd bits of metal from her scrappy remains, but its value was far less than the cash the eight winches would have brought.

About this time, too, I worked on another ammunition job, but this time with less haste and urgency. The ship concerned was reputed to be the *Volnay*, an American ship bringing general cargo, spruce timber, and gun shells to this country (Britain). She was hit —either torpedoed or mined, probably the latter—in the bows and much of her shell cargo fell out on to the sea floor as she went down. During the war names of ships were blotted out. We all thought she was the *Volnay* but we could not be absolutely sure. Now, nearly forty years later, there is a possibility that a High Court case may develop about this ship and that a judge will have to decide about her identity.

This is the way we took ammunition out of her. A torpedo net with a shackle at each corner was lowered into the hold where I was waiting to fill it with shells. The shells themselves were not particularly dangerous but I was very careful with the cordite cartridges which are used to fire the shells, because these cartridges contained detonators, and Tom Gilbert, up above, was an example of the damage a detonator can do. He had lost his eye as the result of a detonator explosion.

All this ammunition was loaded in the *Mallard's* hold and the detonators were not taken out until after the cargo had been landed at Falmouth. After the accident to Tom Gilbert, removing detonators was no longer regarded as a suitable fill-in job for the members of the crew.

Also in this early post-way period occurred a serio-comic incident that illustrates a point already made, that when a diver really needs help he is very often afraid to send an emergency signal. I had gone down off Porthscatho to inspect the hull of a schooner which was being kept afloat by pumping. She had been holed, but not badly, and it was simply a question of fixing her up with a temporary patch. The schooner was anchored under the lee of a cliff. I went down with the ship between me and the cliff. A careful examination of the seaward side of the hull revealed no damage so I ducked underneath her keel to examine the landward side. There was about four feet of water under her keel. The complete examination of the side of a largish ship takes some time but eventually I found the hole, examined it, sketched it on a slate with a pencil, and decided what was best to be done about it. When I came to try and duck back under the keel I found that there was not sufficient room and I could not walk out to the bow or stern and come round that way because I had not sufficient airpipe to permit me to do so.

The vessel was practically aground and liable to sit on my airpipe at any moment. I hoped most fervently that this was because the tide had fallen, but there was always the possibility that the leak had started to gain on the pumps. I sat down on the sea bed to watch my airpipe and to await events. My topside men, no doubt worried by my long absence, regularly asked me by signal if I was all right, and I had to signal back that I was, otherwise they might have started hauling on the life-line, making me the weak link between an irresistible force and an immovable object.

Fortunately it was only the tide that had lowered the ship and after waiting a couple of hours, wondering whether it would be worth my while to invent a pack of waterproof patience cards as a source of solace for future occasions like this, the flowing tide lifted the vessel sufficiently to enable me to crawl, in most undignified fashion, underneath the keel to freedom.

Thereafter, I made a careful note of the state of the tide before I went down, and always tried to make sure of my exit before going into any confined space.

Chapter 17

PATCHING SHIP AND SMASHING SHIP

I SOMETIMES wonder just how many wrecks there are off the Cornish coast. In my time I have dived on dozens of them but my knowledge of even the South Cornish wrecks is far from exhaustive—there must be literally hundreds of them, many of which would not have interested Sandover because they had already been stripped of everything of value. I believe that some Cornish wreck experts have spent a lifetime studying the subject and still feel that they have only scratched the surface.

In the last chapter I mentioned the *Bay of Panama.* She was one of the many victims of the Manacles. In March 1891 a farmer who was paying an early-morning visit to a cove on his land at the mouth of the Helford River, was astounded to see a four-masted ship stranded near Nare Point. Her spars and rigging were covered with snow and icicles. In the rigging he could see some members of her crew, but they did not appear to be moving. The farmer roused the local people and two hardy young men of considerable courage volunteered to swim through the icy water with a line so as to establish communication with the ship. Eventually, however, rocket apparatus was used as it became apparent that there were members of the crew who were capable of helping themselves. Nineteen members of the crew were rescued, but most of those who had taken " refuge " in the rigging in fear that the vessel might founder, were frozen to death.

And this is the Cornish Riviera, I hear you exclaim. Well, the winters in Falmouth are certainly mild enough now but they seem to have been very severe at the end of the 19th century. I suppose the truth is that the winters were severe everywhere, that Falmouth had its usual favourable margin of five or ten degrees, but even at that it was still cold enough to freeze people to death if they were exposed. Incidentally, in this same blizzard in March 1891, three ships were lost on the Manacles in one day.

Earlier, the record had been two in one day. Back in 1809, too, the weather seems to have been very severe. On January 18, 1809 a miller's boy in Kent picked up 95 larks, 26 rooks, three partridges, and two pheasants all frozen to death in one field. On January 14, 1809, two days before the death of Sir John Moore at Corunna, three officers, 72 other ranks, and 36 horses of the 7th Dragoons left Corunna in the military transport *Dispatch*, master—George Fenwick. Two other officers, both Cornishmen curiously enough, went on board the *Dispatch* but eventually decided that another ship, the *Barfleur*, would be more comfortable for them, so they transferred to her.

The weather during the voyage of the *Dispatch* was exceedingly rough and cold. She reached the Lizard on the night of January 18 and at 3.30 a.m. the following morning she was driven on to the Manacles at Lowland Point in a wind of hurricane force. The wreck could not be reached and there were no survivors. Then came news that another ship—the naval brig-of-war *Primrose*—had struck a rock at the other end of the Manacles.

Three in one day, two in one day! Such was the deadly toll of the Manacles. Going to sea was a risky business in the 19th century but nevertheless it was an exceptionally heavy period for emigration and many emigrants lost their lives without ever setting foot on the promised land. Between 1852 and 1859 no fewer than 2,892 emigrants in eleven different ships lost their lives in shipwrecks. One of these vessels was lost on the Manacles.

The Manacles held no terrors for the *Mallard.* Of course, we only visited the rocks in fine weather and the lead was kept constantly going although, as a matter of fact, Tom Gilbert knew his way about pretty well. Here the slow speed of the *Mallard* was a definite advantage. Perhaps Sandover was wiser than we realised. At a speed of two knots you cannot seriously pile up a ship, even on the Manacles.

We divided our time and attention pretty evenly between making and breaking, repairing and smashing. We were veritable ships' surgeons: we mended them and we also performed post-mortems on them. We did many repair jobs that Sandover knew nothing about until they had been completed and we gave him the details so that he could send in his bill. Sandover was rarely in Falmouth on Sundays, but ships would often come into harbour on a Sunday needing inspection and repair. The captain would send ashore for a diver and that would mean me, and another day of rest gone for ever.

Probably the biggest job of this casual kind was the repair work on the *War Hind*. She had been in collision and her stem was bent right round and pointing aft. This rough usage of the metal had left her with a long split under water where the strain on the plates had at last caused a fracture. The *War Hind* was afloat and could be kept afloat by pumping, but she needed a temporary patch to enable her to continue her voyage with less risk and less expenditure of labour on pumping.

As Sandover was not available, we could not give the captain an estimate, and after some hesitation he told me to go ahead and do the job.

For ten days I worked single-handed on this ship, drilling no fewer than 300 holes through $\frac{5}{8}$ inch steel plate with a hand-ratchet drill using a $\frac{3}{4}$ inch bit. Sitting on a stool in an up-to-date factory or machine shop, a toolmaker or fitter could drill this number of holes in an hour or so, but down below with a hand-ratchet drill only, the job was an entirely different proposition. I was sitting down, too, on a steel grating slung from above. In this sitting position there was little or no purchase that enabled me to bring any of my weight to bear on the drill as I ratcheted it round. In fact virtually the only form of pressure I could apply was muscular pressure, and that became very tiring.

After the 300 holes had been drilled, each one had to be tapped to put a thread inside it. This done, steel plates pre-drilled to pattern were sent down to me and I fitted them in position and secured them with square-headed screw rivets which were tightened in position with a wrench. Later all the rivet heads were cut off by hacksaw and the ends were burred over with a heavy hammer. Inside the vessel, a wooden mould was built around the split and this was filled with 20 tons of concrete, but this was not part of our repair work: it was something that could be done by the ship's own engineers and crew once the steel plates had been fixed outside.

On this " temporary " repair the *War Hind* went on to New York, thence to Naples, South America, Australia, and back to Newcastle-on-Tyne before she was finally docked for a permanent repair.

Sandover had not shown up at all in Falmouth during this period and the *War Hind* had sailed before he appeared again. We told him about the job, the time spent on it, the materials used (which were negligible) and so on. Practically the whole cost of the job was composed of my time—about 80 hours. We had not even used the *Mallard*, since all my diving was done from the ship itself. Sandover made a quick calculation, crossed his fingers, and put in an account for £350. It was paid without question. Sandover probably cleared about £250 net profit on this repair.

Actually, it was the *War Hind* job that first set me thinking seriously about becoming a self-employed deep-sea diver. Three or four jobs like that every year would be sufficient to keep me in comfort, if not in luxury.

Another vessel, the *War Crag*, had damaged her forefoot in some sort of strike. Examination revealed that the bow garboard (the bottom plate in the bow) was cracked, and it would be necessary to fit a steel patch about 2½ feet by 2 feet over it. This was merely a matter of drilling and riveting, also by hand of course. After this repair, *War Crag* went back to work for several months before she went into dry dock to have new plates fitted into her forefoot.

Sometimes only very temporary repairs were required, the simplest form being a wooden patch fixed with hook bolts. The hook-bolt is, indeed, a very useful device for temporary underwater repairs. It is rather like a sawn-off walking stick, and the metal is threaded so that a butterfly nut can be tightened up on it. Four hook-bolts are put through holes in the corners of a wooden patch and the butterfly nuts are successively turned until the hook of the bolt can be felt against the inner surface of the metal. Then the whole patch is evenly tightened up. Of course, the joint is made more waterproof or rather watertight if some form of grommet is used. A grommet is merely a washer made of rope and, in underwater work, greased with some kind of fat.

We broke up ships, too, not only on the Manacles but also in coves and bays following the coast-line the other way past Zone Point, Greeb Point, Porthscatho, and into Trewithian and St. Gerrans bays. Perhaps while you were down on holiday in the neighbourhood of St. Gerrans Bay, I was diving on the wrecks of two grain ships, the *Andromeda* and the *Nero*. They lay, scarcely a mile apart, each fitted neatly into its own special gully in the rock, in a beautiful underwater garden, where starfish littered the sand and where mullet and bream swam in and out of tall waving fronds of weed. I worked on these ships day after day for weeks on end, salvaging all the metal that was worth salvaging. Although they were both four-masted sailing vessels, they had auxiliary engines and their metallic value was quite considerable. The metal was hacked off mostly with gelignite, sent aloft where it was stored in the *Mallard* until she reached Falmouth where it would be transferred to a shore dump until there was a sufficient quantity for removal. Sometimes Sandover would charter a ship to take a cargo of scrap metal to South Wales. At other times he would send it by rail.

More and more I was thinking about becoming self-employed. Soon after leaving the Navy my social conscience started pricking me because I saw evidence of terrible poverty all around me. In 1920 I stood as a candidate for the Falmouth Board of Guardians whose job it was to look after the poor, the workhouse, and the seamy end of Falmouth society generally. It was useful, interesting work, but it demanded time off in working hours and as an employee, a member of a small organisation, one might almost say a key man in the organisation since at this time Sandover had no other diver working for him, it was not always convenient for me to take time off. My absence might hold up others. There were other considerations, too. Scrap metal prices were falling and soon it might become uneconomical for Sandover to run the *Mallard* and employ me out of scrap metal sales, so there was a possibility that I might soon be earning less at a time when, with a growing family of two sons and a daughter, I might need to earn more. I did not envisage the idea of setting up in business as another Sandover. If Sandover with a lifetime of experience of the trade behind him could not make scrap metals pay for a time owing to low prices, then it was very unlikely that I should be any more successful.

No, what I wanted to do was to build up a connection in Cornwall purely as a deep-sea diver, doing underwater work for anybody who wanted a job done under water. The big question in my mind was whether Falmouth and district could supply me with sufficient work to keep me reasonably busy.

After considering this for some time, I eventually decided to take the plunge and I became one of the very few self-employed divers in Great Britain.

Chapter 18

I PLUG A HOLE

IF you care to look under the heading of " Divers " in the London Classified Telephone Directory you will find (in this year at all events) only two entries. I imagine that when I set up in business on my own account as a diver, there were not more than half a dozen self-employed divers in the length and breadth of Britain.

Most of the big firms which undertake construction work under water, and most of the authorities responsible for underwater maintenance and repair, such as Port of London Authority, employ their own divers, so that there is not really a lot of work available for free-lance divers. It is far easier to obtain a job as a diver than it is to obtain jobs of diving work. I have had many offers of employment from all parts of the world at very attractive rates of pay but as they all involved giving up my home in Falmouth I refused them, considering it unfair to a family of school-age children to start them off on a Cook's tour of the various seaports of the world. Most of these foreign diving jobs were for limited periods, and at the end of two or three years it would have meant moving on to somewhere else.

In my particular area there was no diver nearer than Plymouth, but even although I should be covering the whole of Cornwall as my area of operations there might not be enough diving work in that area to keep me fully occupied. Which was one reason why I decided to open a cycle shop in Falmouth. This was not merely a financial stand-by in case the diving business did not come up to expectations; it was also to keep my hands occupied in between dips. It was always possible and indeed it turned out so in fact, that many weeks might elapse between one dive and the next on some occasions. At other times I was so busy diving that I had little time to spare for the cycle business.

To begin with I did not buy my own diving gear, as this would have involved a capital outlay that might not have been justified. There was diving gear available for hire in Falmouth, although some of it was not in too good a state of repair. In fact I once went down some years before this on a private job in the self-same suit that used to belong to the Rawlings brothers. I found their old gear in the loft of a marine store dealer. The suit was patched but still serviceable for shallow diving, but the pump, when I took it to pieces for examination, contained a nest of young rats.

A certain Commander Terry came to see me to ask me whether I would obtain some samples of silt and mud from Falmouth Harbour. He had an idea that

Falmouth mud might contain a workable percentage of tin. He based his theory on the supposition that as the River Fal ran through tin-bearing territory the silt deposited in the harbour, Carrick Roads, etc., must necessarily contain some tin, and possibly other metals as well. He was particularly interested in tin because at that time the price of tin was so high that owners of abandoned tin mines in Cornwall were even looking over their properties and gear with the idea of reopening them.

So I borrowed the Rawlings brothers' suit from the marine store, patched it up and repaired the pump. Then I went down in Falmouth Harbour and Carrick Roads to dig up mud for the commander. It was an unpleasant experience. The suit was not watertight and no amount of patching seemed to be able to make it so. Whenever I went down in this ancient dress I came up again nearly as wet as if I had taken a dive in my underwear. The efficiency of the pump was so low that it only just delivered sufficient air for stationary diving at very shallow depth. And, of course, on this particular job heavy manual labour under water was involved because I was, in fact, an underwater navvy, digging trenches in the harbour bottom with a spade. As you all know, digging is quite heavy work above ground; can you imagine what it is like trying to fill a bucket that is already full of water with a spade of mud that dissipates as soon as you lift it up from the sea bed? The inevitable result of the heavy work combined with the poor air supply was that after an hour or so, I began to suffer from CO_2 poisoning. This particular job did not last long as Commander Terry died and the whole project was abandoned. Some years later a Mr. Ash also approached me with the same idea, but apparently it came to nothing. If there is tin in the mud of Falmouth Harbour it is still there for the taking.

Later on I bought my own gear and I see from an old copy of an income tax return that it was valued as follows:

	£	s.	d.
Pump	54	0	0
Suit	12	15	0
2 Air Pipes	30	0	0
2 prs. Boots	10	0	0
Helmet & Corselet	32	0	0
Weights	4	0	0
Lifeline	1	15	0
Ladder	1	10	0
Chain sling	1	0	0
Diving chest	3	0	0
Sundries	1	10	0
Length floating pipe	17	10	0

No doubt these prices will raise a laugh (perhaps rueful) today.

One day a seafaring man, tall and fair, walked into my cycle shop and looked disparagingly round.

" They tell me you're a diver," he said. He spoke good English but with a slight foreign accent. I put him down as the master of a ship, probably Scandinavian.

" That is so," I agreed.

" I've lost an anchor and a length of cable out in the bay," he went on. " Shackle-pin dropped out."

" Did you drop a buoy?" I asked.

" Yes," he replied.

" How soon?"

" Almost at once."

" So the anchor should be fairly near the buoy," I commented.

" Probably," he nodded. " We also took bearings on landmarks."

" That's useful," I acknowledged. I was merely filling in conversation waiting to see what his proposition would be.

" This is a no-cure, no-pay job," went on the captain bluntly. " If you recover the anchor and cable I'll pay you £50: if you don't you get nothing."

Obviously he had had some unfortunate experiences of foreign divers who had embroidered their underwater jobs to make them last longer while he had been paying them on a time basis. I pretended to consider the proposition, although actually I did not need any consideration because he was simply cheating himself. After all the experience I had already had in picking up anchors for Sandover, it would be child's play finding a newly-dropped anchor with a length of cable out in the fairly clear water of the bay. If he had asked me to quote a price for the job I would have said £25, and I would have thrown in a guarantee of recovery, too.

" All right," I agreed.

I went out to the ship with my diving gear and topside men. The depth was only seven fathoms and visibility was good. There was some weed but it was short, not more than three feet long, and not at all thickly sown. In fact I found the anchor less than five minutes after touching bottom: it was only about 20 feet away from the buoy. I asked for a wire rope with shackle attached to be put through the hawse pipe and dropped down to me. As soon as the wire rope appeared, I took it to the end of the cable and attached the shackle, making the pin very secure. Then I gave the signal to haul away.

The captain paid me in cash, doubtless satisfied in his own mind that this method of doing business was the best for a man in a strange port—see how it had produced results—while I was congratulating myself on a piece of good luck.

"Diving seems to be pretty good business," I thought to myself as I went back to my cycle shop, "better than selling repair outfits at one shilling each for a profit of 2½*d.*"

The trouble was that diving jobs of that sort did not occur very frequently.

I had some minor misadventures during this period. Once while diving on a wreck by some mischance I got my foot wedged between two steel plates. Tug as I might I could not release myself. There was really nothing to worry about—the situation was just exasperating, that was all. After another struggle to release my foot I was not so sure and as the exertion was beginning to make me breathe hard, I paused for a few moments to rest and collect my thoughts. Then I remembered an occasion when, as a boy I had got my foot jammed in the points of a railway track.

A passing gentleman had released me by unlacing my boot and my foot had then come out quite easily. With the freedom of movement so gained it had been a simple matter to search around for a stout billet of wood with which to lever the boot out of the tracks.

So I bent down and undid the fastenings of my heavy diving boot. My foot came out easily enough and thereby I gained my freedom of movement, far too much freedom of movement because before I could do anything to stop myself I started floating ungracefully to the surface. Once there my topside men hauled me in, wondering what had happened, and then began a feverish search for something heavy enough to hang on me so that I could go down again to rescue my boot.

On another occasion I succeeded in sticking myself by suction to the side of a ship just like a human limpet. I was looking for a hole in a ship's side, or perhaps I should say an alleged hole. Shortly after the 1914–18 war a ship put into Falmouth. She was making a lot of water and it was supposed that she had struck a submerged rock. She was just about being kept afloat by pumping.

I went down to examine her, and I went over her from stem to stern but I could not find anything wrong so I reported that all her plates were sound. However, the next day I was sent for again as the ship was still making water. After a further exhaustive examination I made the same report, that her hull was sound. The Ministry of Transport inspector pointed out that the water was still coming in very fast and the double bottom tanks were full. This indicated that the six-inch salvage pump that was being used was not in fact coping with the intake of water; the ship was gradually filling and would soon sink.

Down I went again taking with me a piece of rope with a frayed end—a tell-tale—which would indicate whether there was a flow of water at any particular spot. As I was making my way across the bottom of the ship and towards the engine room, I noticed that my tell-tale was being drawn towards a particular spot and I groped my way forward to examine that spot more closely. Visibility was rather poor and possibly I was a little more buoyant than I need have been. At all events as I approached the apparent point of entry of the water, the current of water turned me gently round and drew me to the side of the ship and there I stuck, with my posterior plugging the very hole I had been looking for.

There was not a great deal of suction, but in that peculiar position I could not exert much leverage and I also had to be careful in case the edges of the metal, which I assumed were torn, might puncture my suit. Struggle as I might, however, I could not free myself from this unusual predicament, so I sent the " I need assistance " signal. After a wait of about two hours another diver came down, but even he could not manage to pull me away from the side of the ship so he told me by sign that he was going to report.

After waiting for another fifteen minutes I was suddenly released from my predicament and had it not been for the care of my topside men I should have fallen to the bottom of the sea.

It seemed that after the second diver had gone up to report, a thorough search of the ship had been made and it had been found that a sea-cock had accidentally been left open. This had been closed at once, and the consequent cutting off of the suction had released me, a trifle too suddenly for my liking.

Chapter 19

THE DIVING MAYOR OF FALMOUTH

I SERVED as a member of the Falmouth and District Board of Guardians from 1920 to 1924. Our area covered not only Falmouth but also reached as far as Penryn and East Kerrier. The full Board of Guardians met once a month and the Poor Law Committee once a fortnight. The local Assessment and Valuation Committee was also elected from the Guardians and work on this involved a variable number of meetings every year to consider assessments, to hear appeals, and so on. The Board of Guardians was responsible for " The Institution " or workhouse, and for the general administration of poor law relief.

Applications for poor law relief were made in the first instance to the relieving officer, who would investigate each one and place it before the committee with all the information that he had been able to obtain. In certain cases the committee might ask for the applicant to attend personally before them.

We could not afford to be generous. In those days there was a separate poor rate and there was constant pressure on the Poor Law Committee to keep its demands for funds as low as possible. The cost of all social services were rising and rates were constantly increasing so that house tenants often found it difficult to meet their rate demands, a tendency that was reflected in the increasing number of cases in which it was necessary to issue summonses in order to recover rates.

It was interesting and instructive work. On the Board of Guardians we saw the seamy side of life and anyone with the pen of a Dickens could have written a whole series of novels about the cases and characters that came before us. It was instructive, not only because it taught the members more about human nature than they ever knew before joining the board, but also because—for political newcomers like myself—it provided training in debate and public speaking. It also taught me the primary lesson that the men in charge of public affairs are by no means supermen.

In one typical case a widow with four children said that she could not manage on her relief money of 10*s.* 0*d.* a week: she asked that it should be increased to 12*s.* 6*d.* a week. The chairman, a wealthy farmer, was against paying an increase; he wanted to frighten the woman by telling her that if she could not manage on 10*s.* 0*d.* a week then she and her children would have to go into " The Institution ". The chairman thought that this threat would stimulate the woman to earn an extra half-crown a week by her own endeavours.

" I think she might decide to go to the workhouse," I said. " From what I saw of her I should say she has just about reached the end of her tether; she's ready to give up the struggle. Let us suppose she does decided to go into the workhouse; what will it cost us to keep her and her four children there: in food alone considerably more than 12*s.* 6*d.* a week. I think it would be a better proposition for the woman and her family and a cheaper proposition for the Guardians to pay her 12*s.* 6*d.* or even 15*s.* 0*d.* a week and let her keep her home. She is able to earn a little money every week while she has her independence, and with a supplementary allowance from us she can keep going and keep her family together. If she goes into the workhouse that will mean breaking up her family and her home (and in her position she will never be able to get another home together again) and it will cost the Guardians more. It is a pity that we have to balance one possibility against another in such a cheeseparing fashion, but the amount of money we have available to spend on Poor Law Relief is so inadequate and limited that we virtually have to weigh every shilling."

On this occasion the committee agreed with me and voted against the chairman but it was a Pyrrhic victory for me because I could not help thinking and worrying about the plight of that poor woman, left destitute through no fault of her own, trying to bring up her family on such a miserable pittance plus what she could precariously earn by charing.

Those years (1920 to 1924) were depression years and we of the Guardians saw much misery and suffering without being able to do much to alleviate it.

In 1924 I stood as candidate for the town council and was elected at my first attempt. Maybe the voters thought it would be something of a novelty to have a deep-sea diver as a councillor. For year after year I sat on the council and its various sub-committees. For eight years I was chairman of the Sanitary and Building Committee, a very responsible position for we were then, as now, in the thick of an acute housing shortage.

Let no one sneer at town councillors; they do an excellent job of work for no reward. It is true that a few councillors have axes to grind and that some of them grind them pretty industriously while they are in office. Fortunately my profession was such a peculiar one that it was almost impossible for me to have an axe to grind. I think the voters realised this and consequently regarded me as the lily-white irreproachable of all town councillors, consistently returning me at the top of the poll year after year.

In November 1935 I became Mayor of Falmouth and my mind went back to my childhood, to that meal table quiz, to that reply from my father—" you've got about as much hope of becoming a deep-sea diver as you have of becoming Mayor of Falmouth." The problems of the town at that time were virtually the same as the problems of most towns—a housing shortage, constant difficulty in balancing rising costs against stationary or shrinking income, and the rating revaluation. Oh yes, we had a rating revaluation in 1935 and it caused quite as much consternation and resistance as the recent revaluation of 1955. Indeed, in Falmouth we saw the extraordinary spectacle of the corporation resisting the county valuation committee. In addition, of course, we had our own special problems as a seaport—the provision of docks large enough to attract the bigger ships, and so on. At that time, I remember, we were also trying to boost Falmouth as the potential terminal for the coming air service to America, but this was a forlorn hope because we were really too far away from London, a point that is much clearer now than it was then, because now the Atlantic can be flown in approximately the same time that it takes a train to travel from Falmouth to London.

The housing situation was perhaps the most serious of our problems. The Corporation had already built 500 houses but there was still a waiting list of nearly 300 families. The usual run of business for the year included such oddly-assorted items as arranging the summer concert season, deciding what to do about the surplus of love-birds in Kimberley Park, obtaining and considering tenders for the new electric boosting apparatus, issuing a warning to milk retailers about the necessity for maintaining the purity of their product, considering the needs of public lighting and the provision of additional street lamps, purchasing a recreation ground for the children, considering a proposal to spend £150 on a propagation house at Kimberley Park—and so on. In January 1936 came the first of a sequence of royal events that made my term of office a memorable one—the death of King George V. I was in fact Mayor under two other Kings —Edward VIII and George VI.

Of course I had to entertain (the town voted me an expense allowance of £50 a year for this) and be entertained. When the Fleet put into Falmouth, the council entertained the admirals, and in return they entertained us aboard the *Nelson* or the *Rodney*. It seemed a little strange for me, an ex-rating, to be hob-nobbing with the big naval names of the day in the ward-rooms of famous battleships, but at least I knew enough about the Navy to avoid some obvious gaffes.

On a visit to the *Rodney* one of the guests was an alderman who was a coal and scrap metal dealer—a combination which he made pay in a curious double-sided fashion. He would buy old ships for scrap in Newcastle-on-Tyne, load them with coal, and bring them to Plymouth, thus making the poor old hulks work their passage to their last rusting place. He would sell the coal and then break up the ships.

Aboard the *Rodney*—then a brand-new ship—the alderman gazed about with open admiration.

"Fine bit of scrap you've got here, Admiral," he said, commendingly. For once the admiral was nonplussed.

Quite a number of foreign battleships came into Falmouth, too. During the Spanish Civil War, Falmouth was an examination port where ships proceeding to Spain were detained and inspected to see if they carried any arms or ammunition.

By way of relaxation I acted as M.C. at local boxing matches, and having always been interested in boxing, I enjoyed these occasions very much indeed.

And, of course, I presided at the annual meeting of a number of local societies, such as the Falmouth Ladies Lifeboat Guild, whose self-constituted task was the raising of money by various methods (whist drives, collections, flag days, etc.) for the upkeep of the lifeboat. I remember saying at one meeting of the guild, " There always seems to be difficulty in raising money to save life, but never any shortage of funds for the express purpose of destroying life "—a remark that is as true today as it was then, and no doubt equally sententious. But then a mayor has to be sententious; as a solid citizen he cannot be puckish or irresponsible no matter how much he may feel like injecting a stimulus into some of the dull proceedings in which he has to participate. Nor should he be original; platitudes go down better than paradoxes.

In 1936 I met Will Hay, the famous comedian, who came to Falmouth with Gainsborough Pictures to make a film called " Windbag the Sailor ". Will Hay became very interested in deep-sea diving and nothing would satisfy him but that he should go down below. Accordingly in September 1936 I took him below with me in Falmouth Harbour and showed him something of the underwater world. For a comedian, Will Hay was a most serious-minded man. Later I visited him at his home in Hendon, went to his private observatory, and studied the night sky through his telescope under his guidance.

In November 1936 I was re-elected mayor of Falmouth for another year. Candour compels me to admit that this re-election was probably largely due to the fact that the corporation was in the middle of important litigation over the rating re-assessment, and it was generally felt that it would be undesirable to swap horses in the middle of the stream. The corporation was seeking a High Court decision as to whether the County Valuation Committee were within their legal rights in re-assessing the town of Falmouth and putting the increased assessments into effect before completing their re-assessments in other districts. This meant that Falmouth would be paying on the increased assessments a year and possibly two years earlier than other rating areas in Cornwall. Frankly we saw no good reason why Falmouth should be the first lamb to be shorn. Our view was that the re-assessment of Cornwall should be done as a whole and that all the increased assessments for the county should become effective from the same date. However, Falmouth lost the High Court case and also the appeal that followed on a technicality.

As you may well imagine, this was a busy and anxious time for me as mayor. It involved many visits to London to see counsel, the Ministry of Health, and of course to give evidence at the hearings. The marvel is that I found time to do enough deep-sea diving to earn a livelihood during this period.

During my term of office, momentous royal events took place: the proclamation of Edward VIII as King, his subsequent Abdication, and the proclamation of King George VI.

Chapter 20

A TAP ON MY BACK

I SUPPOSE that if there are ghosts attached to houses where violence has taken place (and after reading the history of Borley Rectory one cannot help wondering whether ghosts are not actual facts) it is equally feasible that there may be ghosts attached to wrecks. Certainly in connection with most wrecks there is a history of violent death in terrible and terrifying circumstances. Actually I never gave a thought to the possibility of underwater ghosts until one day when I was diving on a wreck near the Lizard. It was a fairly old wreck, not the Spanish galleon that is reputed to lie there, but I imagine there were lives lost when this particular ship went down.

I had been stooping down at my work and as I straightened up to ease my back, I felt a tap on my shoulder. Startled—and you have no idea just how startling an experience like that can be in the still depths of the sea—I swung round, but there was nothing in sight. I waited awhile but as nothing further developed, I concluded hopefully that the whole thing must have been my imagination, although deep down I knew it was not.

So I went on with my work, which involved a lot of stooping. The next time I straightened up, the same thing happened. There was a light but nevertheless distinct tap on my back. This happened several times and I began to get annoyed at my inability to trace the cause of the tapping. Eventually I went up to the surface. As my face glass was being removed my attendant said, " My word, you look a bit white round the gills. Anything wrong?"

I told him what had happened.

" You must have had a fit of the jitters," he said. " You can't possibly get yourself tapped on the back by nothing."

" That seems to be pretty obvious," I agreed, uncertainly. It all seemed rather trivial in the broad daylight above. " All right, I'll go down again."

The attendant screwed in my face glass but just as I turned to go down again, he signalled me to come back.

" Here's your trouble," he said, after he had unscrewed my face glass once again.

A long piece of weed had got itself tangled round my outlet valve and at the other end of the weed where it hung down my back was a large limpet.

Aboard the *Cambrian* one day a member of the diving boat crew, in taking the diving gear out of the boat, let slip a pair of diving boots, so that they went to the bottom in 15 fathoms of water. To mark the spot he tied a rag to a stanchion supporting the *Cambrian's* handrail. What he did not realise was that it was the turn of the tide and that the *Cambrian* was swinging about at her anchorage. With every moment that passed the rag-marked stanchion was moving further away from the spot where the boots had been dropped. By the time the news reached me, an hour had passed, and the position of the boots in relation to the rag was very problematical. I waited until the following day at the same time, after making due allowance for the state of the tide, and then I went down at the spot marked by the rag. By good fortune or good calculation—I can't be sure which—I dropped practically right on top of the missing boots, thus saving the rating concerned a reprimand and a possible deduction of quite a considerable sum from his meagre pay.

I really hesitate to tell this next story, also based on the idea of marking the spot, because it sounds so incredible to me, but then I have been accustomed to the sea all my life and maybe some landlubbers really are as green as this; they must be because this actually happened precisely as stated.

A North country couple on holiday at Falmouth hired a boat to do some fishing. The lady was seasick and during one of her visits to the side of the boat she lost her dentures. The husband came to ask me if I would try to recover them.

"Do you know exactly where they were lost?" I asked.

"Oh, yes," he said. "I marked the spot."

"What with?" I asked.

"I threw a box of matches overboard," was his reply. Needless to say I did not dive.

On another occasion a pair of diving boots were dropped overboard just as I had finished undressing and this time there was not a second pair of diving boots available for me to put on. The man who had dropped the boots looked at me in consternation.

"Now what the dickens shall we do?" he asked.

"Fetch me a couple of firebars," I said.

With these heavy weights securely lashed to my feet I went down again and literally skated over the sea bed until I found the missing boots.

Divers are asked to try and find all kinds of missing objects, usually without any adequate information as to precisely where the objects went overboard. I was successful, however, in finding a silver cigarette case that went overboard from a fishing boat. In this particular instance the owner was not a landlubber and he had taken shore marks. Success in this search was due to the fact that the water was exceptionally clear and the silver case shone brightly on a sea bottom free from weed.

While working on a ship loaded with ammunition, the salvage contractor thought that the rate of unloading could be speeded up by employing another diver. Apparently he had seen bricklayers at work unloading bricks and thought that two divers could throw ammunition to each other down below. I did not think very much of the idea but I was always willing to try anything once.

The next day my new assistant turned up. He was the smallest diver I have ever seen. His only previous experience had been mudlarking, i.e. shallow diving in docks and harbours.

When we had got him dressed up in our standard-size equipment with standard weights, he said the gear was too heavy for him. Indeed he could hardly stand up in it, let alone propel himself to the gunwale of the boat and on to the ladder. Nevertheless he was a game little fellow and after a consideration of ways and means he suggested that we should lift him on a couple of oars, carry him to the gunwale, and throw him overboard. Incredibly enough this was done, not once but many times, and the little man was known ever afterwards as "The Diver who had to be Launched".

Another story, which makes me laugh as I think of it today, but which was not so funny when it occurred, relates to the period when I was blowing up the German submarines at Falmouth. These German submarines came into the possession of the Admiralty after the end of the 1914–18 war, possibly as part of the reparations payable by Germany. They were used by the Admiralty for the purpose of testing the effect of depth-charges and after they had been well blasted about they were dragged on to some rocks in Falmouth Bay and left to rot there. There were seven or eight of them. Eventually they were bought by a salvage firm for £800. This firm stripped off everything possible at low water; they did not employ any divers. Then they sold what was left of the submarines to the West of England Salvage Co. Ltd., who employed me to cut them up or blow them up, whichever was the more convenient. The most valuable parts of the submarines, the torpedo tubes made of phosphor-bronze, were under water even at low tide and could only be reached by a diver.

Our usual procedure was for me to set a charge of gelignite, usually half a dozen sticks conveniently packed in an old cycle tube. Then I would come up, take my place in the boat which would be rowed to a " safe " distance. At that time we were experimenting with heavier charges to satisfy the contractor's desire for noise. One fairly heavy charge made a fine, loud noise and threw up a lovely fountain of water. It also threw up a sizeable lump of metal that crashed through the bottom of our boat, leaving a hole through which the water came spurting up at an alarming rate. My attendant took off his coat and plugged the hole and then stood on the plug to hold it in position while I, still in my diving gear, rowed like mad for the shore, which was fortunately not far away. We beached the boat safely. I was sweating profusely and not merely as a result of the exercise. All the way in I was picturing to myself the plight I would have been in if the boat had foundered. In my heavy diving gear I would not have stood a dog's chance, and in this context I mean a dog that has been thrown into water with a couple of bricks tied round its neck.

Chapter 21

AT THE FOOT OF THE SHAFT

ONE of the trickiest experiences that ever happened to me while I was wearing the Dress occurred not in the sea, not in any river, lake or pond, but miles inland some 330 feet below the surface of the earth. You may well wonder how it was that a deep-sea diver came to be operating in the earth. The answer is that wherever there is water there may be work for a diver. This particular body of water happened to be at the bottom of a mine.

From the very outset I did not fancy the job. Diving in very confined spaces is always oppressive, but this particular site was so confined that even I, accustomed as I was to tight and twisty corners in wrecks, felt apprehensive as the approaches to the dive gradually unfolded themselves.

Things were looking up in the kaolin or china-clay business, so much so that owners of abandoned claypits in Cornwall were taking stock of their properties with a view to putting them into production again to take advantage of the high prices currently ruling for this strange substance. Kaolin is really decomposed rock. The name derives from the Chinese word Kaoling, meaning a lofty place or high ridge. A large deposit of this material was first found and used in China. Deposits have been found in other parts of the world, and in or about 1750 china-clay was found in Cornwall by a man named Cookworthy. Kaolin is used in the making of china—a word so commonly used in the English language today that one tends to forget that it is actually the name of the country which first made this sort of pottery.

My services were engaged by the captain of a clay-mine at Roche in Cornwall to find out what was wrong with the drainage pump of one of these old workings. A clay-mine consists of two shafts as a rule, one of which is the working itself and the other, sunk to a deeper level, simply a drainage shaft. There is usually water in the earth where there is kaolin. Additionally, water is used in the mining of china-clay, the material being washed down from the sides of the working by hoses. Hence the necessity for a second shaft. The two shafts are connected by a tunnel and water that gets into the main pit runs off into the deeper drainage shaft, a kind of sump from where it is extracted by pumping.

In this particular instance a pole pump, something like a glorified village pump was used. The drainage shaft was partitioned from top to bottom with timber. One half contained the suction pipe, pole, and other apparatus pertaining to the pump. The other half consisted of a series of platforms connected by ladders and manholes to enable workmen to get down and up the shaft.

As there were seventeen ladders to descend before water was reached, there was no point in donning my clumsy diving dress on the surface. All my gear was taken down to the chamber next above the water-line. As a dressing-room it was certainly not of stellar rank; in fact, if you can imagine the gloomiest and dankest dungeon in the Bastille, the sort of place where Latude was confined, you will begin to get some idea of this awful chamber. There by the light of candles which would scarcely burn—so thick was the air—the topside apparatus was set up and my diving dress was put on. Very soon I began to experience some difficulty in breathing. I liked the job less and less.

The series of manholes and ladders continued right down to the bottom of the shaft. The manholes were about two feet square and it was quite a conjuring trick for me to wriggle through them. After descending another six ladders, by which time I was about 80 feet under water in total darkness and about 330 feet from the surface, my further descent was checked by a large baulk of timber set like a huge pin in the middle of the shaft.

Straddling this, I decided to test my life-line before going any further and found—as I had half expected—that the criss-crossing descent had rendered it useless, either as a means of communication or as a rescue device. Except for the air hose I was cut off from the world, sitting in Stygian blackness, on a piece of wood about 16 inches square. The uselessness of the life-line did not worry me unduly; it merely made me realise that, being incommunicado, I would have to be extra cautious, and that I would have to rely entirely on myself if anything went wrong. As to the darkness I was accustomed to that condition, but the whole set-up was vaguely depressing and although I am not normally a morbid, imaginative man, I experienced a feeling of impending disaster. But this I shrugged off, as a practical man cannot allow himself to be influenced by fancies and morbid dislikes of surroundings, however uncongenial. So I dragged myself along the baulk inch by inch and began to explore the lay-out of the shaft with my hands.

At one end of the baulk was a tank, probably used for priming the pump. This told me that I was somewhere near the bottom of the shaft, but I could find no means of access to the pump itself. Of course, when the shaft was built it was not anticipated that water would ever be allowed to accumulate to a depth of 80 feet in it, but even a slight degree of prescience would have indicated that in the event of the pump failing, water might easily accumulate up to the level of the tank and it would then be necessary to employ a diver to take a look at things. It became only too clear that to reach the pump I would have to descend below the baulk of timber. The space available between the baulk and the side of the shaft was very small, but I came to the conclusion that I could just about squeeze through.

Owing to the weights on his chest, back and front, a diver is narrowest from shoulder to shoulder and, manœuvring myself into this position, I began to edge my way through the gap. Being out of touch with my topside men it was difficult for me to judge the passage of time, but I estimate that half-an-hour was occupied in squeezing myself past that baulk of timber.

Until that moment I had never stopped to wonder why a piece of timber should possess the same name as a hindrance but the connection was sharply brought home to me when I started trying to squeeze my way back. Once through the gap I concluded that before going down any further it would be desirable to make sure that I could get back. I was not impressed by the condition of the walls of the shaft. Having learned the exact angle at which it was essential for me to get through the hole, my return progress was rapid until I was about half-way through. Then I stuck fast, and I realised, too late, that I had overlooked one small but vital factor.

The dangers that deep-sea divers have to face are rarely concerned with denizens of the deep. Much more frequently the danger accrues from the mechanics of the diving apparatus. While squeezing my way down through the gap, the constriction of the suit tended to force the air into the upper part, but the extra pressure did not cause any ballooning because more air was forced out of the outlet valve in my helmet.

While squeezing my way *up*, the constriction forced the air into the lower half of my suit and as there was no outlet valve at my feet, there was a certain amount of ballooning; in fact the tighter I managed to wedge myself into the gap the more my suit was ballooned in the lower half. I could see myself reaching a point at which I could neither go backwards nor forwards if I jammed myself much tighter. After a long struggle which, partly owing to the high concentration of carbonic acid gas in the helmet, exhausted me, I was forced to the conclusion that I could not get through —not like that, anyway!

I could have kicked myself! Even with my 18 lb. diver's boot I could have kicked myself! To have overlooked such a simple, and after the event, obvious possibility. I felt like a child who has thrust his head through a hole in the railings and then finds that he cannot withdraw it.

I rested awhile and tried to think out the position. My head felt muzzy and not at all at its best for clear thinking. It would be necessary to reduce the pressure in my suit to a minimum. As far as air coming in was concerned, my faithful topside men were pumping steadily and would continue to do so without variation until they received a signal from me, but with my life-line snagged I could not send such a signal. I wished passionately that there had been some device in the helmet enabling the diver himself to exercise some degree of control over the intake of air. There ought to be such a device—but there was not. It might be possible to reduce the pressure a little by opening the exhaust valve to its fullest extent. Accordingly I adjusted the valve to the wide-open position and made another attempt to push my way through the gap. I managed to squeeze my body an inch or so further towards the surface, then I stuck fast again.

The whole business seemed utterly fantastic and incredible. It was ridiculous that a strong man in the prime of life should be hopelessly trapped by so trivial a thing as a slight difference in air pressure. But there it was, and there I was, imprisoned by less air pressure than would be needed to blow up a toy balloon, in inky blackness, with no one aware of my plight, and with no means of conveying the news. There was no telephone in my helmet. I had been trained to do without a telephone and I had never used one.

I toyed with the idea of cutting a hole in each of my trouser legs to allow the surplus pressure to escape as I squeezed upwards. Puncturing the suit would probably enable me to squeeze past the obstruction, but it would also let the water in, and if by any chance I could not squeeze through I might conceivably drown myself like that.

After a time, of course, my topside men would begin to get anxious and they would communicate with the captain of the mine. More time would be wasted in a futile attempt to establish communication with me and finally they would begin to scout around for another diver. Probably they would have to send to Plymouth, perhaps even further afield, and short of chartering an aeroplane, a relief diver could not possibly arrive until the following day. By that time, breathing that foul air, I might have passed out; at best I should probably be too weak to be able to do anything to help myself. Besides, what could another diver do? The only way in which he would be able to help me—as far as I could see—would be to saw away the baulk of timber. I had grave doubts about the wisdom of this.

The answer to it all was that it would be almost useless to wait supinely for outside help. My only chance of scraping through depended entirely on my own initiative. Do you actually speak inwardly to yourself when you are thinking? I do, and I think most people do, hence the common habit of talking aloud to oneself on occasion. As the word " scraping " passed through my mind it assumed a literal connotation; it gave me an idea. The timber lining of the shaft had been waterlogged for years and it was fairly soft. When diving I was never without my keen two-edged diver's knife and now I drew this from its sheath and began to attack the wooden wall of my prison with it. Progress was slow and the work was tiring but necessity drove me on against the deadly lassitude caused by that CO_2 overladen air, and as the hollow in the woodwork grew deeper, my spirits and hopes began to rise.

Then I dropped the knife!

I look back on that moment as the blackest of my whole life. Even today the thought of it makes me shiver. The revulsion of feeling was too extreme—from high hope to black despair; it was almost enough to make a man give up trying, to fold his hands and await whatever fate had in store for him. Heaven alone knew what accumulation of soft mud lay at the bottom of the shaft. As soon as my feet started stirring it up, the knife would gradually sink. My chances of finding it again were about one thousand to one—against!

Down I went again, very cautiously, prospecting every inch of the way with my bare hands. Suddenly, on a projecting ledge of wood, my groping fingers encountered the lost knife and nearly knocked it off the ledge before I realised what it was. The thousandth chance had come off and I began to feel that this might not, after all, be my day of Fate.

How I gripped the haft of that knife! My hand ached with the strain of holding it so tightly. After another spell of scraping, I managed to squeeze my way past the baulk of timber and once past that obstruction I lost no time in getting to the dressing-room. My topside men were in a state of near-panic as no signal had been received from me for more than two hours.

" What kept you so long?" asked the captain of the mine, when I reached the surface.

" A baulk of timber," I replied shortly. " The pump cannot be reached until something is done about that piece of wood."

" Why not cut it out with a saw?" he suggested.

" I don't think that would be a very good idea," I replied. " Certainly I would not be the man to be sitting on that baulk when it is sawn through. I think the shaft would collapse."

" Oh, it was probably only put there as a support for the priming tank," said the captain of the mine.

"I don't think so," I replied. "They would not have needed so large a baulk just to support the priming tank. A shelf bracketed to the wall would have done that job. No, I think the baulk was put in to support the shaft. What I suggest is putting a wire whip around the baulk; then you can pull it out from the top of the shaft with a winch."

After some further discussion, this method was agreed. I dived again into the earth and fixed the wire whip round the baulk, quite a conjuring job in itself, but the condition of the wire was in keeping with the rest of the ancient equipment belonging to the mine, and it broke as soon as the winch began to pull.

A week elapsed before a new wire could be obtained and then the baulk was duly pulled out—with the result that the whole drainage shaft collapsed! Fate had indeed been kind to me, once more.

Chapter 22

FISH CATCHES MAN

LIKE most men I have occasionally thrown a baited hook into the sea, and after a wait—usually a long wait—have dragged up a struggling fish at the end of the line. On such occasions it never occurred to me that the day might come when the positions would be reversed and I should be struggling at the end of a line held by a fish.

There is a hoary journalistic adage that dog bites man is not news but that man bites dog is most definitely news. I discovered the truth of this after I had been " caught " by a shark. For years I had quietly carried on my trade as a deep-sea diver in the tip of South-West England, but outside Cornwall no one had ever heard of me. Then this shark incident occurred and immediately my name was front-page news in almost every newspaper in the world. There is no doubt about it that the public loves to imagine the deep-sea diver as a man beset by perils from the great monsters of the deep. I could have rotted for ever in that death-trap of a Cornish claypit without earning more than a paragraph of obituary in one or two local papers, but when a diver gets tangled up with a shark—that is something the public wants to hear about, in full detail.

There is a rather half-baked theory of life that whatever you do is sooner or later done to you, and I suppose everyone can pick out a few incidents of just retribution from his own life which seem to prove the truth of this. For instance, after blowing up fish with gelignite, I was myself blown up in exactly the same way. If this theory has any basis in fact, then deep-sea divers should certainly never go fishing in their spare time; their trade renders them too vulnerable to possible piscatorial retaliation.

The trade of deep-sea diving is certainly full of sharp contrasts. At one moment the diver may be performing a purely routine job and the next moment he may be battling for his life. At the time of the shark encounter I was engaged on a most prosaic job, that of laying a sewerage pipe into the sea off St. Ives. It would indeed be hard to think of a more unromantic job for a diver, but for me it was a good bread-and-butter job, several hours work a day, weather permitting, for months on end. Divers like that kind of job for its regularity and continuity.

The seaward end of the pipe had to be laid first in a prearranged position against a large rock on the sea-floor. I rather wanted to staple the end of the pipe into the rock to make a firmer construction, but the contractors thought it would be sufficient to leave the terminal section of pipe simply lying in a bed of concrete. After laying the last section of pipe first, the job then moved backwards, guided by a wire, to link up with the shore end of the construction. The routine consisted of laying a bed of concrete by arranging bags of cement in the shape of a cradle. These special bags are porous, allowing the wet concrete from one bag to mingle with the concrete from the bag above it, so that when setting takes place, over a period of 48 hours, a solid mass of concrete is left. As soon as sufficient bed was completed, a section of pipe 12 feet long by 2 feet in diameter was lowered down to me. Each section had to be bolted on to the existing pipe line.

On land, such heavy sections of piping would require the combined muscles of a gang of labourers to jockey them into position and get the bolt holes aligned. A deep-sea diver has to learn how to perform such jobs single-handed; two divers on such a job would have increased the expense of laying the pipe-line enormously. The weight of the pipe was taken by the ship above so that except at the last moment of fitting there was little muscle-work to be done below, but since every movement of the ship, as it rode at anchor, imparted similar movement to the slung pipe, a considerable amount of juggling was necessary to get each section into position.

On days when there was a heavy swell, it was essential for me to keep a wary eye on the up-and-down movements of the pipe. One moment it would be above my head and the next moment it would be lying at my feet with all the lifting gear slack and the ropes curling around my feet. Then up it would go again, the ropes tightening suddenly and ready to throw me if I did not take care to stand clear of them.

At St. Ives there is nearly always a heavy ground swell. After every twelfth wave or thereabouts—the figure was not constant and I am not stating an absolute rule of wave behaviour—there would come a series of three big ones, of which the middle wave was the biggest of all. You, yourself, may have been idly counting the waves while you were lazing on the beach at St. Ives, watching for the big one that would bring the water seething to within inches of your deck chair. Down below, a few hundred yards out, I was counting the waves as an essential part of my job, waiting for a reasonably quiet period for the crucial task of fitting the pilot bolt. Otherwise, just as the bolt was being fitted, the ground swell would come along and lift the pipe three or four feet above my head, after which it would have to be carefully manœuvred into position again.

It was a job that needed a lot of concentration, but after some weeks I got to know the local conditions so well that I made progress at really incredible speed, considering that I was working entirely on my own.

This particular contract always held a certain amount of interest for me because of the vast number of spider-crabs—" guzzies " the local fishermen called them—that haunted the neighbourhood. I could not imagine why they hung around there because there did not seem to be anything special for them to eat. Some days they were present in their thousands, so numerous that there was not sufficient room for them on the sea-floor and they were forced to scuttle about on top of each other. This layering of the crabs was quite distinct from the normal habit of the female of carrying her husband on her back. Frequently I had to kick hundreds of crabs aside in order to be able to get at my work. Other days there was not a crab to be seen. Although they were a nuisance, I was always glad to see the " guzzies ". Their absence was invariably followed by a spell of rough weather which made it impossible to do any diving. I wonder how they knew what weather was coming, and where they went to for shelter.

I was working on this job for most of the summer of 1937 and from time to time there had been reports of sharks in the vicinity of St. Ives. My topside men had seen a shark on several occasions and holiday-makers at St. Ives had actually looked down on one from the pier. Presently it was established beyond reasonable doubt that there was only one shark, a fish about 14 feet in length, which seemed to have selected St. Ives as its summer holiday resort. The fish became quite a familiar feature of the neighbourhood during the holiday season. The locals christened it " Lizzie ". I was on very good terms with the fishermen because on one occasion two of their boats had managed to get their nets tangled up under water and I had gone down to sort out the mess—one of those voluntary jobs that a specialist sometimes undertakes because he happens to be there. So the fishermen and I always used to pass the time of day and exchange jokes about " Lizzie ".

I had never seen the shark, but for about a week prior to my encounter with it, my topside men had watched "Lizzie" playing about around a broken-down breakwater about 100 yards away from where I was working. Each time I came up they asked me whether I had seen anything of the shark, but I had not. The water was rather cloudy with suspended sand and my range of vision was limited to about ten feet.

One day the contractor's son—young Mr. Lobb—asked to be taken down below and after he had been dressed I piloted him downstairs and held his hand while he inspected the progress of the work. Like many novices in diving he apparently came to the conclusion that there was nothing in it. A day or so later my civic duties necessitated my attendance at a meeting of the assessment appeals committee and during my absence the contractor's son got himself dressed and did a little solo diving.

Hearing of this on the following day when I returned to work, while admiring his spirit, I thought it desirable to take him to task for his foolhardiness, little dreaming that shortly I was to provide an object-lesson worth hours of lecturing.

At 11 a.m. I went down and carried on with the job of pipe-laying. My topside men were not very experienced in the work of attending a diver and one of their faults was to allow too much slack in the life-line and air-hose. This is not a serious fault, but there is always a possibility that the lines may get snagged round some obstacle. On this particular morning my air-hose was actually lying on the sea-floor, and once I had nearly tripped over it. The circumstance was hardly worth a special signal but I made a mental note to remind them of it. I still speculate idly on what might have happened had I been stricter and had I given the " Take up slack " signal. At that very moment the thing happened.

From the point-of-view of the topside men, this is what happened. I cannot do better than quote reports from two of the papers that gave the incident full journalistic treatment. This is from the " Daily Express ".

St. Ives, Cornwall, Friday.

" The Mayor of Falmouth, Mr. C. A. Chard, working as a diver in St. Ives Bay, was on the sea bed today when he saw a shark gnawing the rope that connected him to a boat. The men in the boat, thinking Mr. Chard was signalling to them, pulled at once, and brought up the broken rope. A few minutes later their fears were allayed when Mr. Chard came to the surface by means of the airline. He said that the shark was only six feet from him when it bit through the rope and that he was badly knocked about. He was able to go home to Falmouth without help. The shark, a 20-footer, has often been seen around the rocks in St. Ives Bay during the last three months."

And this report is from the " Western Morning News ", issue of Friday, October 29th, 1937.

" Mr. C. A. Card for the past two months has been engaged by Messrs. Lobb Brothers, contractors of St. Ives sewerage scheme, as a diver in connection with the laying of pipes off Porthgwidden Beach. At about 2 p.m. yesterday the men in the boat felt a tugging at the rope and thinking the diver was signalling to them they commenced hauling and were surprised when they pulled the severed rope on board and Mr. Chard had not come to the surface."

They were certainly surprised, especially young Mr. Lobb.

This is what happened from my point-of-view. There was a swirl in the cloudy water above me and there flashed into view a large shark, its mouth wide open, travelling like a torpedo. The next thing I knew was that I was being dragged about on the sea-floor at lightning speed like the tail of a cracked whip. Even while I was being swished around I guessed what had happened. Lizzie had fouled my life-line, either with her open mouth, or else the line had looped itself around her tail. Possibly the shark had taken a snap at the line mistaking it for an eel. Whichever it was, the shark could not get rid of the incubus and was dashing about like a mad thing in an effort to shake me off.

The shark jerked me this way and that, banging me up against the pipe and then twitching me away, not giving me half a chance to get at my knife so that I could cut the rope. Finally, after a vicious tug that sent me spinning a dozen feet, the commotion ceased and I found myself sprawling on the sea-floor, wondering whether I was still in one piece or not.

Cautiously I picked myself up and gave a tentative signal on my life-line. There was an ominous slackness on the rope. I pulled the line down and after gathering in about ten feet, the broken end came into view. That my air-hose was intact I knew because I was still receiving air and I blessed the carelessness of my topside men in giving it so much slack. Had the air-hose and life-line been together, as they often are, and as indeed they should be, I should have provided an unexpected meal for the spider-crabs.

I debated in my mind the desirability of giving a signal on the air-hose, but decided against it as my topside men might start hauling me up by the air-hose alone. This would have been quite a proper and correct thing for them to do, but in this case I did not know whether or not the air-hose had been damaged or its connections weakened by the rough treatment it had undergone. I came to the conclusion that it would be safer to blow myself up, so I closed my outlet valve and floated to the surface with my knife ready in my hand in case "Lizzie" paid a return visit to the scene.

Work was suspended for the day and the ship went back to St. Ives, whence I returned to Falmouth in company with my eldest son, who had been in the boat. I escaped with minor injuries, mainly bruised knees and elbows and barked shins. Young Mr. Lobb, the contractor's venturesome son, was rather silent and preoccupied for several days after this incident. Probably he too was thinking, as I have often done, in terms of what might have been.

"Lizzie" was seen several times afterwards by my topside men, but I never again saw the shark that had "hooked" me. That was just as well for "Lizzie". After my encounter with her I kept two sticks of gelignite handy in the boat. I did not bear the shark any ill-will but given the opportunity I intended to cure her permanently of her habit of fishing for men.

Chapter 23

NO MORE DIPS

FOLLOWING the St. Ives contract, no more diving work of any consequence seemed to be in prospect in Falmouth, and having been offered a job as general foreman in the construction of a dam at Mabe, about four miles from Falmouth, I decided to take it in preference to diving jobs abroad. The idea was to dam off a small valley and flood it. This would create a much-needed additional water supply for Falmouth and district. This job lasted for about three years, in fact it carried on into the war period. I remember that at one stage it involved draining another reservoir and this provided us with plenty of fish, including quite a number of trout, a welcome addition to our war-time menus.

At the end of 1940 a North-country regiment was stationed in the district. One frosty morning two soldiers from this regiment were riding a motor-cycle and sidecar along the road that ran alongside the big reservoir adjacent to our workings when the machine skidded and ran off the road into the reservoir. Encumbered as they were by their heavy winter outfits, the men did not stand much chance in the deep water. The accident happened in full view of other members of the regiment and assistance was, therefore, immediately available, but even so it came too late. One soldier was pulled from the water fairly quickly, but he was beyond the aid of artificial respiration. The body of the other man could not be found.

The accident happened at about 9.30 in the morning and a messenger was immediately sent to me where I was working on the dam to tell me what had happened. Having served for so many years on the town council I appreciated, perhaps better than anyone else immediately concerned, the importance of prompt action. Although the water from the reservoir was thoroughly filtered before it reached the household taps in Falmouth, it was a terrible thing for a dead body to be in the reservoir. Obviously it had to be found and taken out as soon as possible.

I commandeered a lorry and was driven into Falmouth, where I picked up my diving gear while the lorry waited. Back at the reservoir I picked a scratch crew of topside men from the dam workmen, gave them brief instructions, got myself dressed, and went into the reservoir. I was actually under water by 11 a.m. For a diver there was no great depth of water in the reservoir at that point, about 14 feet only. One would have thought that it would be a simple job to find the body. Obviously it could not be very far from the water's edge. However, the job was by no means simple. The bottom of the reservoir was covered with large boulders and in between the boulders there was soft mud. Every step I took stirred up a cloud of silt, and as there was no current to carry it away, it simply clung all round me, obscuring my vision until it had settled again, and the settling took a long time.

Indeed after the first few tentative steps I began to realise that I might have to hang about there for hours, waiting long minutes between each step for the silt to settle. I decided to remain where I was until my line of vision was clear and then to look closely and carefully in every direction before taking another step. The drawback to this plan was that at certain points of the compass my range of vision was severely limited by the large boulders on the bottom. The body might be hidden behind any one of fifty-odd boulders. The only thing I could do was to stare intently, looking not for a whole body, but for anything that might faintly resemble part of a body, a projecting boot or hand for instance.

I stood perfectly still and stared so intently that my eyes began to water. Then I noticed something that gleamed palely in the green water in a crack between two boulders. It might have been anything but at least it was something to investigate. I clambered over the boulders and there in a pit about six feet deep was the thing I had been looking for and the white gleam I had seen was the dead face of the unfortunate soldier. Dressed as he was in heavy dispatch rider's boots and stormguard coat, he had not stood a chance, but had been dragged straight to the bottom. I slid down into the pit, picked him up, and put him across my shoulder in a fireman's lift. Then I climbed out of the reservoir.

That was one of the grimmest little jobs in my life of deep-sea diving, not dangerous, not even thrilling, just macabre and horrible and so sad. But it was a job that had to be done for the public good, although in fact the public knew nothing about it. Indeed, I doubt whether more than half a dozen people in Falmouth knew that there had been a dead man in the reservoir. It was hardly the kind of news that anyone would wish to broadcast.

It was not necessary for me to attend the inquest and I never knew who the young man was.

When the dam-building job ended there was, as usual, plenty of diving work elsewhere. I was approached by the Naval Salvage Department with offers of jobs at Maryhill in Glasgow and at Avonmouth. There were also diving jobs available at Malta and even as far away as Port Elizabeth in South Africa, but there was no regular diving work available in Falmouth. My roots were too deep in Falmouth for me to consider going elsewhere so I took a shore job with the Ministry of Sea Transport for the rest of the war, doing in my spare-time whatever odd jobs of diving happened to turn up.

Naturally I was consulted on various matters relating to underwater problems. One of these problems concerned the disposal of a land-mine that had fallen into Falmouth Harbour without exploding. I suggested to Commander Kennelly, whose particular problem it was, that perhaps the safest method of disposal would be to moor an old lighter over the spot, send a diver down with a wire for attachment to the land-mine, pull the mine up with a winch until it was within a few feet of the surface, then hang the mine, by the wire, on the bows of the lighter. A tug with a very long tow-rope could then tow the lighter to a deserted cove until it beached.

Maybe it was not a very good suggestion. At any rate it was not adopted. Instead a young naval officer who was an expert on bomb disposal, but who was not a diver, went down in a diving-suit to try and remove the detonator of the mine. A hero, that boy, if ever there was one! Something went wrong and the mine went up during the operation. No trace of the young naval officer was ever found. In addition the diving-boat crew of about 13 were killed.

For me there followed a few odd jobs of diving—routine stuff like picking up lost anchors—and thus gradually, almost imperceptibly, after thirty years, I retired from the world below the sea.

Little more remains to be said. At the age of 70 I can look back and say that I not only achieved precisely what I had aimed at but also that I found it eminently satisfying. I wonder how many of us, in the evening of life, can say as much. I was lucky not to be disappointed.